

S.50.

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CONFERENCE ON ASTERS AND PERENNIAL SUNFLOWERS

AT CHISWICK, TUESDAY, OCTOBER 6, 1891.

OPENING ADDRESS.

By Mr. J. G. BAKER, F.R.S., F.R.H.S.

I WILL detain you only a few minutes whilst I sketch out what may be called the general botanical outlines of the subject we have met this afternoon to discuss. Compositæ is one of the best marked of the natural orders, and it is the largest of all of them. About one in ten of all the flowering plants belong to this order, and it keeps up this proportion in a wonderful way both in the old world and in the new, and in all latitudes from the tropics to the arctic-alpine zone, as represented either in the far north or just below the snow-line on high mountains. Its proportion and the absolute number of species are highest in North America and Mexico, lowest in India, Malaya, and Polynesia. The total number of known species may be estimated at eight thousand or ten thousand. The most obvious characteristic which distinguishes the different Compositæ from one another is in the corolla. We may distinguish three leading types of form—first, the ligulate type, as shown in all the flowers of the Dandelion; secondly, the tubular type, as shown in all the flowers of a Thistle, Tansy, and Groundsel; and, thirdly, the irregular, more

or less bilabiate type, as shown in the Mutisiaceæ. With this third type we have nothing to do at present, and it enters very little into European garden botany. The flowers of the first and second types are aggregated into heads of three different kinds, and the most obvious classification of garden Compositæ is into three groups, as follows: First, the homogamous ligulate type, in which all the flowers of the head are ligulate, as in *Crepis*, *Lactuca*, and *Hieracium*; secondly, the homogamous tubular type, in which all the flowers of the head are tubular, as in *Eupatorium*, *Vernonia*, or *Carduus*; thirdly, the heterogamous type, in which the central flowers of the head are tubular, composing what are called the disc, and the outside flowers, composing what is called the rays, are ligulate. To this third group belong both *Aster* and *Helianthus*. In the homogamous types all the flowers of the head are usually hermaphrodite. In the heterogamous heads the disc-flowers are usually hermaphrodite and the ray-flowers more or less incomplete as regards their reproductive organs. *A priori* one would say that tubular flowers and ligulate flowers represent two extremely different types of structure, but we find that in point of fact they change into one another very easily. The *Dahlia*, which is nearly allied to the Sunflower, is properly heterogamous, but the majority of garden Dahlias have been changed by cultivation, so that all the flowers of the head have become homogamous and ligulate. In the common Camomile (*Anthemis nobilis*) all these types may be seen. It is properly heterogamous, but homogamous ligulate and homogamous tubular forms may be found not unfrequently. *Aster* is properly heterogamous, but there is a form of our common English seaside *Aster Tripolium* without any ray, and the other English species, *Aster Linosyris* never has a ray. More constant characters are found in the involucre, the pappus, the anthers, and the shape of the style-branches. The tribes (of which Bentham and Hooker make thirteen) depend mainly on the shape of the style-branches. *Aster* is the type of one large tribe which is called *Asteroideæ*, *Helianthus* of another which is called *Helianthoideæ*.

In *Asteroideæ* there are upwards of ninety genera, but many of them differ from one another by very slight characters. Of large well-known genera that belong to this tribe, *Conyza* and *Baccharis* are homogamous, and in the latter the flowers are

unisexual. *Bellis* differs mainly from *Aster* by the entire want of a pappus. There is an *Aster* which is common in the Swiss Alps which is exactly like a Daisy in habit. The heterogamous *Asteroidæ* fall into two groups, a heterochromous series, in which the ligulate ray-flowers are lilac, or reddish, or white, and a homochromous series, in which the ray-flowers are yellow. The best-known genus of the homochromous series is *Solidago*. *Aster* as it stands at present contains 200 or 300 species, and is concentrated in the United States. I will not attempt on the present occasion to discuss its subgenera and species in detail. I dealt with them fully in a paper which I contributed to the *Gardeners' Chronicle* in 1884, and all that I could say further now would be that a small number of additional species have been brought into cultivation. Nearly all our garden Michaelmas Daisies belong to the species that grow wild in the eastern United States. There are forty species of *Aster* in the Rocky Mountains and fifteen in California, and most of these are different from the eastern species, and have not yet been brought into cultivation. *Erigeron* only differs from *Aster* by its more numerous narrower ray-flowers, and runs into it by gradual stages of gradation. *Olearia*, of which there are sixty to seventy species in Australia and twenty to thirty in New Zealand, differs mainly from *Aster* by its shrubby habit.

Helianthoidæ is another large tribe, of which many of the 140 genera only differ from one another by very slight characters. In a large proportion of them the heads are heterogamous and homochromous, the ray being bright yellow. *Helianthus* in a wild state is entirely confined to North America. Several of the genera that are allied to it most closely, such as *Wedelia*, *Aspilea*, and *Viguiera*, are not hardy. *Coreopsis* has a different pappus, *Rudbeckia* may be distinguished at a glance by its very prominent disc, *Helianthella* by its flattened fruits, *Silphium* and *Heliopsis* by their large leafy outer involueral bracts. A very interesting paper might be written on the way in which the three commonest garden types, *H. multiflorus*, *annuus*, and *tuberosus*, have been changed by cultivation through a long course of years from their wild originals. The species are extremely difficult of limitation. I will only say that I think they may be best classified under three groups—first, the annuals; secondly, the perennials, with short adpressed

involucral bracts; and thirdly, the perennials, in which the outer bracts of the involucre are long and more or less spreading. Mr. Dewar has had a large collection constantly under his eye for many years, and is going this afternoon to give us the results of his observations.

The predominance of Asters, Sunflowers, and Golden-rods is one of the most marked characteristics of an American as contrasted with a European landscape. Take, for instance, the following extract from Whittier's admirable picture of late autumn in New England :—

O'er the bare woods, whose outstretched hands
Plead with the leaden heavens in vain,
I see, beyond the valley lands,
The sea's long level dim with rain.
Around me all things, stark and dumb,
Seem praying for the snows to come,
And, for the summer bloom and greenness gone,
With winter's sunset lights and dazzling morn atone.

Along the river's summer walk
The withered tufts of asters nod;
And trembles on its arid stalk
The hoar plume of the golden-rod.
And on a ground of sombre fir,
And azure-studded juniper,
The silver birch its buds of purple shows,
And scarlet berries tell where bloomed the sweet wild-rose.

The glow of bright colour which is thrown over our gardens in September and October by the Asters, Sunflowers, Solidagos, and Dahlias is one of the most valuable gifts that fall within the compass of horticulture for which the old world stands indebted to the new.

THE GENUS ASTER.

By Professor G. L. GOODALE, Harvard University, U.S.A.

THE kind invitation received from the Secretary of the Society to present a communication on the genus *Aster* came during a protracted journey. Up to a late date it appeared possible for the writer to be present at the meeting, and supplement these notes by verbal statements and by the exhibition of illustrative specimens. Official duties, however, render this impossible, and the paper is sent in its present form as an indication of his great

interest in the Society, and to be made the basis of discussion regarding certain practical aspects of the subject.

The present communication will be confined to a consideration of those American species of the genus *Aster* which can be regarded as promising subjects for improvement and cultivation. It is an interesting fact that some of the American species in this genus are known to science chiefly through descriptions of their cultivated forms. For instance, Dr. Asa Gray says *Aster versicolor*, Willd., is "common in European gardens, doubtless from Atlantic North America, but decisive indigenous specimens are hardly known." (Gray, "Synopt. Flora," vol. ii., p. 194.) *Aster patulus*, Lam., "chiefly known in cultivation," is another case in point, as are also the following: *Aster diffusus*, Ait., var. *horizontalis*, "a plant of the gardens, not exactly matched by indigenous specimens," and *Aster Novi-Belgii*, L., var. *lævigatus*, of which it is said that there are "hardly any wild specimens exactly answering to the plant cultivated and even naturalized in Europe." *Aster Novi-Belgii*, L., var. *litoreus*, has been known in European gardens from early times, under different names, all of the descriptions upon which the synonyms were based being from cultivated plants. Examination of these and other similar cases shows that confusion has arisen from the changes which the plants undergo from even the slight degree of cultivation associated with raising them from seed in a garden. In many, if not most, of the cases there has been an improvement in those features which most commend themselves to horticulturists, and in a few instances the plants may be reckoned among established favourites.

It seems highly probable that this list might be considerably increased.

In reviewing the American species which may be available for horticultural purposes, we are fortunate in possessing an admirable monograph by the great botanist, the late Asa Gray, of Harvard College, in which the morphological and geographical relations of the constituents of the genus are clearly set forth. It is the design of this communication to make an analysis of Dr. Asa Gray's monograph which may be somewhat helpful to horticulturists. If this brief sketch can aid in making our beautiful American species better known to European cultivators, the writer will feel that he has, in part, discharged the obligation

which he, in common with all American lovers of flowers, owes to the Royal Horticultural Society of Great Britain.

The following statistics may be of interest before we enter on the task of analysing Dr. Gray's work.

The genus *Aster* comprises 200 species. These are found chiefly in the northern hemisphere, particularly in North America, where about 120 of them occur. Europe and Asia share nearly all the rest, while Australasia is said to possess none.

The order to which the *Asters* belong is the largest among flowering plants, comprising one-tenth of all flowering plants, and about one-eighth of those which occur in North America. The *Asteroid* tribe includes the Golden-rods and true Daisies, and many genera which have only a few species each; in some genera there is only a single species. That which it most concerns us to know with regard to the relatives of the *Asters* is the capability of the most closely allied genera for improvement. On the one side we find *Sericocarpus*, a genus of rather unattractive low herbs with small heads; on the other side stand the species of *Erigeron*, or *Fleabane*, a few of which are rather showy and *Aster*-like, with broad ray-flowers. Botanically speaking, the differences between the *Fleabanes* and the *Asters* are very slight, no natural lines of demarcation existing.

Dr. Gray divides our American species into thirteen subgenera, arranged under two heads, based on their lease of life. The first series comprises the perennials, and has ten subgenera; the second includes the biennials and annuals, and has three subgenera. But even at the outset there is an anomaly, showing, as every part of the genus abundantly demonstrates, that one cannot draw hard and fast lines: the species *A. coloradoensis* is apparently perennial, but in all other particulars it is closely related to the section which contains annuals and biennials. The distinction is biological rather than morphological.

The sections or subgenera grade into each other in a manner which forbids the establishing of any precise limits, and the same is true of the species themselves. The latter are connected in many cases by intermediate forms which conceal from view all lines of demarcation. We may go one step farther, and say that almost every species has varieties which at one time or the other have laid claim to being considered of the rank of true species. Of course these statements may be applied with little

change to almost any of the large genera of flowering plants, but they are of importance from a practical point of view when we consider the capabilities of any given group for improvement under cultivation. Moreover, the existence of such intermediate forms renders possible the application of that most valuable of all horticultural aids—hybridisation. Although its use is by no means confined to the large genera, it is in these rather than in the small genera that the process has been most uniformly successful. Nature herself has taken this matter in hand in the



FIG. 1.—*ASTER ALPINUS*. (From the *Dictionary of Gardening*.)

genus *Aster*, and given us hybrids which, however perplexing they may be to the systematist, are full of promise to the experimental physiologist and horticulturist.

The first American subgenus, *Amellastrum*, contains a single species, *A. alpinus* (fig. 1), which, like many other plants of high altitudes and latitudes, is found also in the colder regions of other continents. The second subgenus, *Megalastrum*, has two large-flowered species, both belonging to the hills of our South-west. The long rays would make these species of interest in an experimental garden were it not for the peculiar conditions—namely, those of a dryish country—under which they occur.

Heleastrum, the next subgenus, has three species of the south-eastern coast, all growing in what we know in the Atlantic States as Pine-barrens. The sterile soil of these barrens nurtures some of the most interesting plants of our American Flora, as is well shown by the long list of New Jersey plants. But experience shows that these children of neglect are by no means amenable to ordinary culture. Some of the Pine-barren plants which thrive under very adverse circumstances in their forbidding home do not thrive at all when we transfer them to our gardens and houses. A few of them succeed remarkably well, a few only indifferently, and some are hopeless from the very outset. It is impossible to state beforehand whether given plants from our sandy woods will bear change or not; we find that the only way is to try the experiment where there is promise of good results. In the present instance, the small size of the flowers of the species of the section would render the experiment hardly worth the while.

Hesperastrum has a single species from the high mountains of California; *Biotia*, two species from the woodlands of Canada extending as far south even as Georgia, but in our Southern States only in the higher mountains. These two species delight in shade, and form a pretty garden ornament under thickets, but neither has any great claim to horticultural consideration.

The next subgenus, *Aster* proper, comprises no less than seventy-four well-marked species, together with no end of varieties and probable hybrids. Taking the more promising of these in the order adopted by Dr. Gray, we notice first *A. Herveyi*, which resembles *A. macrophyllus* of the last group and *A. spectabilis* of this. One of its forms has been long in cultivation under other names, especially *Biotia commixta* and *Eurybia commixta*. It flowers in the gardens of the Atlantic coast in late summer. The rays are of reddish violet. *A. spectabilis*, one of its nearest congeners, is generally a little brighter in colour, and blends well with it in groups. There are few finer masses of violet than our wild plants of these and the associated species as they are grouped together on the borders of woods.

Passing over a few species which are attractive from a botanical point of view, we come to the superb species *A. Curtisii*, which grows in rather dry soil, in woodlands, in the Alleghany Mountains. The whole plant is generally smooth, always so in

the typical form, and has the large deep violet flowers clustered in very loose panicles. There is little doubt that attentive search can find a more compact form which will be more desirable as a garden variety. Omitting certain species which are from our far and middle West, we come to one of the handsomest plants of the whole section, namely, *A. Novæ-Angliæ*. The rays are very numerous and of a charming brilliancy of colour, whether we have the variety with rose or with purple flowers. The rose-coloured variety is a true race, coming true from seed for the most part. Individuals which have been under cultivation for a long period do not show the least tendency to lose their peculiar bright rose. When well grown this plant attains a height of ten feet, and is conspicuous for its highly leafy character. Its strength and marked individuality would indicate this as an excellent species to serve as the basis for hybridising experiments.

The next species to be mentioned in this short list is one with firm, nearly entire leaves, mostly smooth, and with showy heads, the rays light purple or violet. This is *A. Shortii*, and belongs to the woodland banks of Kentucky, although extending far beyond these limits. It has long been a favourite in the Harvard University garden, where its next neighbour is a species with deep purple flowers. Associated with this are other species with petioled heart-shaped leaves, such as *undulatus*, *cordifolius*, *Drummondii*, and *sagittifolius*, all of which are widely diffused. By far the largest group in this subgenus comprises the species with root-leaves which taper more or less, in no case heart-shaped and petioled, except in the interesting and obscure intermediate forms occasionally met with. These latter species are classified by Dr. Gray around the types *A. lævis*, *A. ericoides*, *A. multiflorus*, and the remainder in two classes, *Divergentes* and *Vulgares*.

A. lævis is allied to the garden plant *A. versicolor* and the South-western species, *turbinellus* and *virgatus*. Intermediate forms connect *lævis* and *virgatus*.

A. ericoides varies widely, but generally has rather small heads; *A. polyphyllus* of the same group has showy heads and has long been known in gardens. All of the species in the foregoing alliances seem likely to improve under cultivation. The great change which takes place in some individuals of *ericoides* is in

the direction of augmented size, but not, so far as the writer has observed, in better colour.

The next alliance, clustered around *A. multiflorus*, our most widely diffused species, contains only one which has been much known in gardens, namely, *A. amethystinus*, which has been called *A. pilosus* and *bostoniensis*.

In the group of Divergentes there are three species which vary in many ways, namely, *dumosus*, *vimineus*, and *diffusus*. One of the varieties of the latter is a favourite in cultivation.

The group Vulgares, a large alliance, takes all the rest of the members of the section. The first species in Dr. Gray's list has been "cultivated from earliest days in European gardens," and in some places on the Continent it has shown a tendency to escape and establish itself in open places and by roadsides. The larger and beautiful *A. Novi-Belgii* has been cultivated both in the old world and in the new, and some of its varieties are favourites. Many other species closely allied to this are found in the West, three Atlantic species representing the alliance in the East. The latter are *A. tardiflorus*, *prenanthoides*, and *puniceus*, with its varieties. *A. puniceus* is conspicuous for its wide range of colour.

We pass next to the subgenus *Erigerastrum*, having two Alaskan species which need not for our purpose be further mentioned, and to the two subgenera *Dœllingeria* and *Ianthé*, among which are placed the species formerly assigned by Torrey and Gray to *Diplopappus*. Some of these are pretty, but are hardly of horticultural interest. The subgenus *Orthomeris* has a simple pappus, and comprises some of our most widely spread species. Many of them are mountain and swamp plants, presenting peculiar difficulties in cultivation.

Of the remaining subgenera, *Oxytripolium*, *Conyzopsis*, and *Machæranthera*, we are inclined to single out only *A. Bigelovii* for special mention. This is a beautiful plant, having a wide range of variation and susceptible of immediate improvement in a rich garden.

Incidentally, attention has been called to the distribution of some of the species in these different subgenera; allusion must now be made to some practical considerations based thereon.

The habitat of a plant is by no means a sure guide as to the soil, exposure, and treatment which it should receive in a garden.

Everyone is aware of the ridiculous mistakes which are sometimes made when new plants are introduced to notice: sometimes reasonably hardy plants have been treated as tender, and tender plants have been subjected to severer weather than they ever had in their former home. These mistakes are due to the well-known fact that in a given climate the local conditions may make all the difference in the world; in the tropics, for instance, in the high lands of Ceylon, one can see English plants thriving as if they were in Britain, while in hot exposures not many miles away true tropical luxuriance is a noteworthy feature. In America the distance of a few miles sometimes makes a greater difference than that to which I have just referred, and one must take this into account in attempting to judge from its station, as given in the Manuals of Botany, just what place a species must have assigned to it in cultivation. This is particularly the case in such a genus as the Asters, where many of the species in some of their forms are very patient under any kind of treatment, and their immediate congeners are the reverse.

Therefore any statements relative to the special stations of these plants must be regarded as hints rather than as directions for horticultural management.

At the beginning of the task of describing the range of our American species of Aster we are met by a difficulty which is very hard to meet, namely, the immense size of some of the provinces of the Dominion of Canada and of the States of the Union. For instance, the occurrence of a given species at a few points in the State of Texas entitles it to rank as the denizen of a commonwealth possessing more than 250,000 square miles, considerably larger than Germany or France, and twice as large as all the British Isles taken together. The provinces of Ontario and of Quebec are each larger than Italy. When an Aster is said to have a range from Canada to Florida, it may extend through twenty-five degrees of latitude; while from Alaska to California there is rather more difference than this.

The species which have been indicated in the foregoing communication as desirable for cultivation are, as a rule, those which have a wide distribution; for instance, *Aster Novæ-Angliæ* ranges from Canada and Saskatchewan to Carolina and Colorado; *Aster Novi-Belgii* from New Brunswick to Georgia and westward to Illinois. Surely we have here sufficient difference of climate

to warrant our confidence in urging the wide cultivation of these and similar species in European countries, particularly in the north.

From this hasty analysis of Dr. Gray's elaboration of his favourite genus it is evident that a considerable number of species are promising subjects for cultivation. They evince an immediate response to better surroundings, except in the case of some of those which prefer a sterile soil.

No one can examine the species of this genus as they appear in a ramble through any of the eastern or of the middle portion of what we used to call the West in America without being impressed by the immense number of intermediate forms and of the wide variation in the well-marked species. They display such differences as to assure any horticulturist of a speedy reward from selection alone. But when we add to this the fact that so many of them hybridise spontaneously, giving us stronger plants, although perhaps relatively infertile, it is easy to understand how wide is the field from which a skilful cultivator can choose the material for his work.

Lastly, even a cursory examination of the species shows that geographical representatives are everywhere found in this polymorphous genus. A given species will vary, we will say, in two directions. On one side of the range of this variation will be found a species connected by intermediate forms, and this may serve as the type of extreme divergence on that side and limit. On the other side will be found other forms, and these may be gathered around a type which marks the limit in that direction. It is really curious to see how often a species is bounded by morphological limits which are nearly coincident with geographical ones. The bearings of this on the practical question which this paper has undertaken to present are plain: a study of these geographical relations will in most cases indicate what we can expect for our gardens and point out a method of treatment there. With the kindred subject suggested by such a geographical study, namely, as to the probable point of origin of the American Asters, the present paper cannot deal. It is reserved for another time and place.

THE MICHAELMAS DAISY AS A GARDEN PLANT.

By the Rev. C. WOLLEY DOD, M.A., F.R.H.S.

BEFORE reading the notes which I have written on this subject, I must say that some of the specific names to which the committee appointed to examine the Chiswick collection of Michaelmas Daisies have assigned certain garden forms, have to-day taken me rather by surprise. I do not here question their accuracy, but may remark that perhaps the decisions come to may not prove final; and without intending the slightest disparagement to botanical science, I may say that botanists and gardeners alike seem doubtful about the history and parentage of some of the most ornamental forms. Up to this day I retained all the specific names given on the authority of Kew about three years ago; some of these have now been changed, and others declared to be uncertain.

When tall Phloxes and perennial Sunflowers are on the wane in gardens, Michaelmas Daisies become conspicuous, and later, when the first frosts of October have disfigured Dahlias and Heliotropes, the colours of these hardy plants become brighter, and the flowers seem to derive new vigour from the cold nights, being reminded by them of their native home on the North American prairies, to which a large proportion of them belong.

Any flowers which carry on the gaiety of a garden nearly into winter ought to be carefully encouraged; and though the Michaelmas Daisy cannot compete either in brightness of colour or in size of flower with the Chrysanthemum, still it ornaments many a flower border in which its less hardy rivals would never open their buds at all; and though there are few gardens in which it has not yet found a place, there are still fewer in which it is made as much of as it deserves to be.

The habit of Michaelmas Daisies is so various that one cannot speak about it in general terms. From the tallest, *Aster umbellatus*, growing eight or nine feet high, to the dwarf nondescript, probably belonging to a form or hybrid of *A. versicolor*, rising scarcely to a height of as many inches, every gradation in stature is easily found; and from *A. Amellus* or *A. dumosus*, which from a small base spread to a width equal to their height, to those which make a narrow umbel of flowers

only at the summit, there is no definite line of distinction. Others, though tall, flower quite down to the ground. Some run at the base so provokingly that they must have great compensating merit to save them from the rubbish heap. But enough has been said to show that we can tell nothing of the habit of Michaelmas



FIG. 2.—*ASTER PUNICEUS*. (From the *Gardeners' Magazine*.)

Daisies which is true of the whole class, except that they continue to flower when nearly all other flowers in our gardens are over. Perhaps the weakest point about them is their colour, or rather their want of colour. Different shades of dull purple are too

prevalent ; good clear blue is almost unknown ; pure white is scarce, and in most cases soon becomes tinged with purple ; the tints to be found are seldom gay and bright.

As the subject of these notes is Michaelmas Daisies, we must try to define the name. The same plant may flower in



FIG. 3.—*ASTER ACRIS*. (From the *Gardeners' Magazine*.)

August in the warm gardens of the South or West of England, whilst in the North it will not open a bud before October. I propose then to fix no limits of lateness, but to exclude early kinds of Aster which in the Midland Counties are generally over before the middle of September. I need not say that perennial Aster

and Michaelmas Daisy are not convertible terms. For instance, none of us would call *A. alpinus* (fig. 1, p. 7) and *A. Thomsoni* Michaelmas Daisies, though both are very ornamental garden plants. On the other hand, all Michaelmas Daisies are now included in the genus *Aster*, except three or four good kinds which belong to *Boltonia*. I will mention by name a few of the good early *Asters* which are hardly Michaelmas Daisies, and should not be selected to take part in an October display. *A. puniceus* (fig. 2), a variable kind with large slate-coloured flowers, and another white form, and *A. pyrenæus*, with large pale blue flowers and rather ragged and distorted rays—a plant which has narrowly missed being first-class—both of them come out before the wealth of summer flowers is over, and would be more welcome a month later than they are in August. Next there are the doubtfully named varieties of the subgenus *Galatella*, one of which, four or five feet high, commonly called *Aster acris* (fig. 3), is an excellent border plant when well cultivated, but hardly late enough to be a Michaelmas Daisy. Two dwarfs of the same season deserve mention; one of them, perhaps the nearest approach to blue in this class, and named *A. spectabilis*, grows about eighteen inches high, has an excellent free habit and a good flower with a golden disc, but is generally over by the middle of September. Another early dwarf of merit is *A. corymbosus* (fig. 4), generally, but not always, with black wiry stalks, much branched, and abounding with small white starry flowers. These five which I have enumerated are all good species and good border flowers, but generally too early to be included in an October display. I have omitted to speak of those which I have not found ornamental, whether early or late. With the exception of *A. acris*, the other four names are well-defined and undisputed. But when we come to the mass of later-flowering Daisies it is difficult to define them either by botanical name or by any other character. Name is no guarantee of merit, because we find good and bad included in one species; it is no indication of time of flowering, because in some—*A. Novæ-Angliæ*, for instance—we have comparatively early varieties, and others so late that in a backward season they do not reach flowering at all in my garden. We cannot infer height or habit from name, because in some, say in *A. versicolor*, botanists have set down to one species forms from six feet high

to six inches. So in speaking of Michaelmas Daisies as garden plants it ought to be known that specific names, even though correct, may be very misleading. When we are told that perennial Asters comprise between three and four hundred botanical names of species and varieties, it seems hard that even these names may be correctly given without fixing the characters of the flower from a florist's point of view. Perhaps, therefore, these botanical names had better be ignored by gardeners in this class, unless accompanied by some recognised fancy name,



FIG. 4.—*ASTER CORYMBOSUS*. (From the *Dictionary of Gardening*.)

because there are few about which botanists are agreed as to the type of the species.

However, the number of botanical species which include all the most ornamental Michaelmas Daisies is not large, perhaps about one-tenth or less of the whole genus. I have been proposing to myself to limit the number of varieties I cultivate to fifty, and these probably would not be found to belong to more than twenty species at most. A good many of them seem to be garden hybrids, perhaps of doubtful parentage, but it matters little to gardeners whether a good flower is a good species or not. Before enumerating the probable species amongst which the

fifty recommended varieties are to be found, I may first say that for several years I greedily collected from botanic gardens, from nurseries, and private flower-borders every variety of Aster I could find, either with or without names. Probably from two hundred to three hundred forms have flowered in my garden, and half that number of names, some genuine, many unauthorised, have been written on my labels. Next the process of elimination was rapidly but cautiously carried on. To some which I retained I gave fancy names, chiefly for my own convenience, often adopting the name of the giver, so that some Asters have become popular with a name which was never intended to go beyond the limits of my garden walls; others, apparently variations of one species, I distinguished by numbers, so the naming of my collection has never laid claim to any authority; but it seemed to me that any fancy name was better than a misapplied botanical name. It must also be remarked that there is so much room for the exercise of different tastes in selection from the endless varieties of this genus, that all gardeners should exercise for themselves a free choice, both in the number and the kinds to be adopted. The mutual interest in gardens would be greatly increased if we could see a different set of Michaelmas Daisies in each garden. Cultural conditions, too, may make corresponding variations in ornamental qualities, and the warm sandy soils of Surrey may develop merits in a plant which the cold clay of Cheshire fails to show. For instance, *A. sericeus* and *A. ptarmicoides* (fig. 5), which are highly spoken of by some, fail entirely in my garden.

But to return to the proposed fifty, the selection must be taken as very general and capable of contraction or expansion. It is difficult to know how to class the plants, but it is roughly done according to their height as they grow in the retentive soil at Edge Hall. Of kinds which exceed five feet, I cultivate *A. umbellatus*, the tallest of all, and spreading its branches elegantly, but without merit in colour or individual flower; next come two or three tall garden forms, probably of *A. Novi-Belgii*, of which one which I call Robert Parker, after the worthy nurseryman of Tooting from whom I obtained it, is perhaps the best; two or three of *Novæ-Angliæ*, one with pink flowers exceeding six feet; there is a tall type of *A. versicolor*, now perhaps to be superseded by improved seedlings; and in the heart-leaved

section there is *A. Drummondii*. Then come the mass of Michaelmas Daisies from five to three feet high. Many of the best of these are classed amongst *A. Novi-Belgii*, and are variable



FIG. 5.—*ASTER PTARMICOIDES*. (From the *Gardeners' Chronicle*.)
(The magnified figures represent (1) the margin of a leaf, (2) echinate pollen grains, and (3) a ray-floret with pappus.)

in colour as well as in height; *A. turbinellus* in its best form is excellent, and what is now classed as the type of *A. lævis*, with larger leaves and smaller flowers, has hitherto been mixed

with it. Several good forms seem to range between *A. laevis*, *A. Novi-Belgii*, and *A. Curtisii*. Two or three of *cordifolius* are not surpassed in abundance of flowers and elegance of growth, the best of all being one hitherto known in my garden as Photograph, a name justly objected to by my friends, and which I have proposed to change to Diana. Other good flowers for this row are *A. polyphyllus* and its allies, perhaps the nearest approach to pure white; two or three good Boltonias, one generally called in nurseries *A. japonicus*, now to be called *B. incisa*; two or three coming under *B. asteroides* of Asa Gray, a species including, as many do, both good and bad, the best forms having large pink flowers and being formerly known as *B. glastifolia*; *A. amethystinus*, with dense little bright flowers, should not be omitted, nor should the best forms of *A. versicolor*, known hitherto in gardens as *A. discolor major*, plants of high merit. Of those below three feet, by far the best belong to the Amellus group. As these are often raised from seed, and vary a little, the selection of them should be carefully made. Another, *A. dumosus*, is very distinct in habit. *A. ericoides* (fig. 6) varies, but contains neat and elegant varieties. *A. Shortii*, in the heart-leaved class, has good qualities. There is a good and floriferous pink Aster, long wrongly called in catalogues *A. longifolius formosus*, and *A. horizontalis*, very persistent in late autumn. Last to be mentioned as late flowers are two excellent dwarfs which compete for the name of *A. hybridus nanus*. One belongs to *A. versicolor*, and is quite prostrate in habit; the other, with pale rosy-purple flowers, is of very doubtful parentage, but both deserve to be in every garden, and must have names assigned which are no longer ambiguous, as the two plants are very distinct. This enumeration must be taken as indicating the direction in which good Asters are to be looked for rather than as laying down any rule. Above all, I repeat, let the selection be made by sight, and do not trust names.

As for cultivation, every Michaelmas Daisy should be grown by reference to its ascertained habit. As far as my experience goes, good and rich soil suits them all. I am shy of any which run at the base; but if such are grown, they must be replanted annually, and replanting is far better than cutting round them. This annual division suits a good many

of the class, especially *A. Novi-Belgii*, *A. lævis*, and their kind. In this class small detached pieces, showing in spring only two or three shoots, make by autumn the best plants and have the finest flowers. They must neither be crowded by having other plants too near them, nor have the stalks too close on each plant, because to be shown in good condition they must



FIG. 6.—*ASTER ERICOIDES*. (From the *Dictionary of Gardening*.)

have room to flower freely on each branch down to the lowest. Experience alone will teach the best way to treat each kind. The best time for dividing all of them is as soon as spring growth begins. This may be in January or may be in March, according to the season, but the young shoots should be active and not more than an inch above ground. It is not all that are

better for annual division; those of the *Amellus* section may go on untouched for three or four years or more. Close-growing kinds like *A. Novæ-Angliæ* and *A. cordifolius* soon exhaust the soil beneath them, and if not divided want a rich top-dressing in spring. As for where and in what company to grow these plants, different writers have laid down very different and very arbitrary rules. One says they ought only to be grown in wild shrubberies, where they may lean against the shrubs, so as not to require tying. Others, who know that any attempt they might themselves make to grow them in this way would end in their falling over and being smothered by nettles and docks, advise growing them in a special border, and staking them all carefully. No absolute rules should be given, as different modes suit different surrounding conditions. In my garden I grow them mixed with other plants in the herbaceous borders, and elsewhere in lots of thirty or forty kinds arranged and graduated together, but all supported by tying, which is an absolute necessity with me. When flower-buds begin to form, those in the mixed borders, which have previously been loosely tied to one rod, are tied out to several short and not conspicuous iron rods, and the branches spread so as to make them cover as much breadth as the flowers will fill. In this way a border which till August was quite full of other flowers may be made to appear in October quite full of Michaelmas Daisies. Some kinds deserve an isolated treatment to display them to their best advantage. I have one of doubtful parentage which I have hitherto called Ledbury, raised from seed and given to me by Mr. Grant, of that town. This, if well cultivated, and provided with plenty of side room, branches widely and horizontally, and flowers in drooping masses down to the very ground, in the form of a well-grown Holly-bush. This, if sheltered from high winds, which easily break it, has of all Michaelmas Daisies I have ever seen the best habit; but it would be comparatively worthless if crowded.

Cultivators of these plants should know that the young leaves of many kinds are a favourite food of slugs. Those which break at the base whilst still in flower attract these marauders most, as affording a prospect of food during the mild days of winter. The slugs hide below the crowns, and if not prevented go on eating the young growth in spring till the plant perishes, and the loss is often ignorantly attributed to frost. There are parts of

my garden where neither Pyrethrums nor Delphiniums nor Asters will flourish as perennials unless the slugs are checked by dressing the crowns with lime and soot in autumn.

Some of these Asters are liable to a disease which also spoils many perennial Sunflowers and Rudbeckias. Half or all the plant suddenly withers when in flower. It may be due to hot



FIG. 7.—*ASTER AMELLUS BESSARABICUS*. (From the *Dictionary of Gardening*.)

sun following heavy rain, and I call it sunstroke for want of a better name. *A. cordifolius* is often killed by it, except when planted in shade.

As for the future of the Michaelmas Daisy, it will be gathered from what has been said that the best of them have probably been produced by development in English gardens; the way to

improve them, therefore, is to continue growing them from seed. All do not ripen seed alike. *A. puniceus*, for instance, has its fertile seeds blown all over the garden, and the seedlings, if not weeded out, become a nuisance; but its contemporary, *A. spectabilis*, I can never raise from seed, though the heads feather well. Aster seed is difficult to judge; the achene, or body of the seed, may appear very lean and shrivelled, and yet contain a live germ, so proof must be waited for in the result of sowing. *A. cordifolius*, with its tiny flowers, ripens good seed in abundance; so do some of the forms of *A. lævis* and *A. Novi-Belgii*. Of others, the variety *A. bessarabicus* (fig. 7) ripens seed better than its type, *A. Amellus*. *Boltonia* seeds freely, but, as far as I have tried, reproduces the parent exactly. The middle-sized forms of *A. versicolor* show a great disposition to vary and to improve. *A. Novæ-Angliæ* has so many forms all well defined within the species that it probably is capable of improvement by seed, and might produce good accidental hybrids. Few gardeners seem yet to have raised these plants systematically from seed with a view to the improvement of the flower. I have often grown them from bought seed, but the plants have either been worthless or constant to type. It would be best to save a little seed from all that ripens in gardens where many good kinds are grown together, and sow it each year. If a hundred gardeners out of the ten thousand or more gardens where collections of Michaelmas Daisies are cultivated would each devote a few square yards of ground to raising every year a thousand seedlings, we should, perhaps, get some advance annually. This would require hardly any work; the seedlings would be sown and left growing in the open ground, and as nearly all flower the year they are sown, any which showed merit would be marked and transplanted at once.

There is no doubt that two adjacent Asters often form hybrids in gardens, but good results are quite exceptional. Asters with the best colour and largest flowers, *A. spectabilis* and *A. pyrenæus* for example, are over before the best seed-bearers begin, and probably no one has tried saving pollen of these to fertilise *A. Novi-Belgii* and *A. cordifolius*. An intermediate between such different flowers as *A. pyrenæus* and *A. cordifolius* might be excellent, but would more likely be worthless. Seedlings come up plentifully amongst their parents in borders where Asters are grown, but I have found danger in leaving these

where they come up. "Ill weeds grow apace" is especially true of these plants. They perhaps flower unnoticed the first year, and the second assume a running habit and infest the roots of their neighbour in such a way that they cannot be disentangled, and in another year they overwhelm and supersede it; then they get distributed—spurious usurpers of a good name—and are perpetuated. I have often seen a choice border spoilt by these running seedlings.

It is superfluous to add, be careful in the selection of seedlings. Tall or short, panicked or umbelled in flowering habit, are matters of taste; but nothing is of greater importance than the form and colour of the disc. A large disc, with a rich, deep golden colour, sets off a flower which has no other good points, and may in the next generation prove a very important factor.

At all events, there is plenty of room for improvement both in colour and habit, and by looking over hedges we may accidentally find distinct advances in cottage gardens. But in order that we may encourage the improvement of a flower, we must show that it is a desirable flower and worth the trouble of developing. The way in which Michaelmas Daisies have generally been dealt with, both in private and in nursery gardens, has hardly tended to raise them from obscurity. It can hardly be expected that they will ever compete with Pyrethrums and Delphiniums in popular favour, but in most gardens they are grown more or less, and what is worth growing at all is worth growing in its best form.

Now that these plants have been brought into prominent notice by being honoured with a conference at Chiswick, we may hope that they will not be afterwards lost sight of, but that a selection will be made from the many kinds brought together this year, which will form a standard for the future to which gardeners may refer their specimens.

For botanical names of species we must look to Kew, where many plants ought to be and are grown which are not very ornamental; but the gardens of the Royal Horticultural Society ought to keep nothing which, after a fair trial, does not prove to be decorative, and to add nothing to the collection which is not a distinct advance in its kind on those already there. Neither the space nor the time required to keep up such a collection would be any obstacle to this plan. Once a year, in early spring,

the border would be gone over, and all the plants which required it would be dug up, and pieces replanted, according to the kind, the soil beneath each being renovated. All this might be done in two or three hours, and weeding and staking, and watering in dry summers, would be the only additional care wanted. The number might be limited, say to fifty or sixty; but there should be a spare bed in some corner where candidates for admission might be grown on probation, one of the limited select being superseded for each new-comer. Something of this sort would tend to keep up the interest in this useful, but hitherto neglected, class of plants.

PERENNIAL SUNFLOWERS.

By MR. D. DEWAR.

WITH perennial Sunflowers, as with many other strictly garden genera, the difficulty in the way of a proper classification appears to increase as we extend our knowledge and become more minutely acquainted with the many forms now in cultivation. Sunflowers are very old garden-plants—they have been grown in our gardens for several centuries; they were eagerly sought after in the days when Peter Collinson was a leader in English horticulture, and many of the best species and varieties were known to Philip Miller, who grew them in his garden at Chelsea; though, let us hope, they were much nearer the old types than we at present find them.

Many of the species are said to be extremely variable in a wild state, and as they are also said to hybridise freely both wild and under cultivation, there can be little wonder that we are to-day confronted with a set of nondescripts which, to say the least, are very puzzling.

The collection growing in the Chiswick Gardens are from various sources, and from them I have mainly taken my notes. It is, perhaps, one of the richest collections ever brought together; and although some few of the species in cultivation are not there represented, it may, on the whole, be taken as a good index of our wealth in perennial Sunflowers.

Besides being very beautiful and deservedly popular garden-plants, the roots of a few of the wild species formed the staple

food of some tribes of the American Indians. The Jerusalem Artichoke (*Helianthus tuberosus*) is largely cultivated in this country for its potato-like tubers.

In Russia at this very moment, when famine is devastating whole districts, the starving thousands are, we are told, being maintained chiefly on the seeds of the cultivated *H. annuus*, which there attain a large size. The many different forms, and the many altogether wrong names we have found in the course of our investigations, may be placed under at most thirteen species, including such plants as I have named *H. divaricatus* and *H. Maximiliani*, and which I am not quite certain would not have been better associated with *H. decapetalus* and *H. giganteus*, so near do these plants (altered by cultivation) approach the latter-named species. We are extremely fortunate in the fact of the late Dr. Asa Gray having worked among living as well as dried plants, and also in the fact of Asters and Helianthus being his especial favourites. When over in England in 1882 he visited the principal public and private collections of Sunflowers and Michaelmas Daisies, and so modified or enlarged his descriptions in his "Synoptical Flora of North America" as to include most of those then in cultivation.

The number of species given in Bentham and Hooker's "Genera Plantarum" is put at fifty. This, however, includes the genus *Flourensia* in its entirety, as well as *Linsecomia*, *Echinomeria*, and *Harpalium*. Dr. Gray in his "Synoptical Flora" modifies this somewhat, reducing the number of species to forty, but keeping up in part the genus *Flourensia*, and putting Peru, Chili, Mexico, and California outside his boundary.

The great centre of distribution in North America will be found to range between latitude 30° and 50°. One or two, however, extend to British Columbia, and beyond almost to Hudson Bay. Their wide geographical distribution and the varied nature of many of the habitats might well suggest some other treatment than that to which they are subjected in our gardens. Some are found in dry Pine and Oak barrens, in wet ground and in moist shady woods, prairies, plains, and rocky slopes, dry gravelly soils, moist alluvial ground, and along the banks of streams. In the face of all this, however, we have only to look around us to-day to see ample proof of the skill and perseverance of the English gardener who, it may be not unlikely, grows many of

these beautiful flowers within the space of a few yards, and under exactly similar conditions.

With regard to the flowering period of these perennial Sunflowers, I think we might conveniently divide them into three seasons—late summer or early autumn, mid-autumn, and late autumn. To the first group belong the early form of *rigidus* (which I have named *æstivus*), and *mollis*, which is a very distinct and rare species. To the second group belong the other *rigidus* forms, *divaricatus*, *multiflorus* and its varieties, *occidentalis*, *Maximiliani*, *decapetalus*, *giganteus*, and *lævigatus*, while to the last group belong *lætiflorus*, *angustifolius*, *orgyalis*, *doronicoides*, *grosse-serratus*, and *tuberosus*, which in its cultivated form rarely flowers in this country. The first section begins flowering towards the end of July or early August, followed by the other *rigidus* forms, which carry on the mid-season until we have them at their best in September. These are followed by the late group, which flower until cut off by the frost.

With few exceptions these perennial Sunflowers are distinct enough in habit and flower-colouring to be included in their entirety in at least every large garden. Where space is limited, however, the grower will make a choice suitable to his own particular requirements.

Dr. Gray, as might have been expected with so many years' constant study, did his work carefully and well; but, with the greater light thrown on *H. rigidus* in recent years, I hope we may be pardoned for introducing a modification that may somewhat simplify matters. What we want particularly to do is to draw a line between *H. rigidus* and *H. lætiflorus* that will be more readily grasped than that given by Dr. Gray, and which depended chiefly on the yellow or purple discs. This character we find most unreliable, as even among the early-flowering *H. rigidus* we have distinctly yellow as well as purplish discs. I have also attempted a key by which we may at least place those in cultivation in three groups: In the first, the involucrel bracts are short, ovate, obtuse, or acutish—example, *H. rigidus*; in the second, the involucrel bracts are half as long again as the last, ovate, lanceolate-acuminate, or attenuate-acute, including *lætiflorus* as we have defined it, *occidentalis*, *mollis*, *lævigatus*, and *doronicoides*; and, lastly, group three, in which the involucrel bracts are nearly as long again as the last, loose, somewhat

squarrose, lanceolate-subulate, or gradually attenuate from a narrow base to a slender point, and includes *divaricatus*, *orygalis*, *Maximiliani*, *grosse-serratus*, *giganteus*, *tuberosus*, *multiflorus*, and *angustifolius*, and I venture to hope that this small arrangement will facilitate the identification of the species and varieties at present in collections in this country.

In dealing with the species I have found *H. rigidus* by far the most troublesome, and in its relation to *H. latiflorus* a very important alteration might be made. I have found *H. rigidus* the most variable of all the species in time of flowering, in height, and in habit, but there is a similarity in all the forms that leaves no doubt whatever as to which species they belong. With a view to fixing as well as distinguishing these forms, I have drawn up short descriptions of no less than six of them, all differing sufficiently from each other in time of flowering, in size and colour of flowers, and in height, to warrant varietal distinction. The first I have called *æstivus*; it is the earliest to flower, and was first sent out by Messrs. Ware, of Tottenham, under the name of *H. japonicus*—a very misleading name, as no Sunflowers, so far as I know, have ever been found in Japan. The second, which flowers a fortnight later, and is the *pubescens* of Barr, may be taken as the type; it differs chiefly by its more acute, somewhat spreading involucre bracts and purplish-yellow disc. Number three I have called *H. rigidus* var. *grandiflorus*. It was sent to Chiswick as “green-stemmed,” *doronicus*, and *strumosus*, all of which names are wrong—as a matter of fact it has purplish stems; *doronicus* is evidently an error for *doronicoides*; and *strumosus* is an altogether different species. The fourth is *rigidus* var. *elegans*; the fifth *rigidus* var. *latifolius*; and the sixth *rigidus* var. *semi-plenus*, which came to Chiswick under the name of *H. angustifolius*. This latter is the plant about which so much has been written lately, and its origin, so far as we can trace it, is as follows. The plant seems to have originated at Kew; at any rate so says Mr. William Thompson, of Ipswich, and it appears that Mr. Thompson first received it from Kew in Mr. Sutherland’s time under the name of *H. doronicoides*. Dr. Gray is said to have named it *H. latiflorus*, though I am pretty certain not without a query. It was afterwards sent to Professor Sereno Watson, who said it was nearest to *H. latiflorus*. All this is perfectly reasonable and straightforward, but there is now growing at Kew a plant

(illustrated in the specimen before me), which I submit is much nearer to, if not the typical wild *H. latiflorus*. All the forms of *H. rigidus*, including the variety *semi-plenus*, have thick coriaceous shagreen-like leaves, and longish peduncles to the flower-heads, while in *H. latiflorus*, as growing in the Kew collection, Dr. Gray's description of thinner leaves and shorter peduncles fits to a nicety, and he pronounced in my hearing, a few years ago, the opinion "that if any plant in English gardens was *H. latiflorus* that was the plant." The dried specimens at Kew are not very reliable, inasmuch as, with one exception, they are garden specimens; the only really wild specimen does not show the involueral bracts.

In the British Museum there is also only one wild specimen (from Ohio), and this agrees in every detail with the Kew plant, which I have no doubt whatever is the true *H. latiflorus* as defined by Dr. Gray, and that all the other forms will have to be placed under *H. rigidus*. The characters of the Kew plant, as I said before, agree in every detail with Dr. Gray's description, and may be given briefly as follows: Somewhat taller than tall forms of *H. rigidus*; very leafy, even to the top; the leaves thinner, serrated, and tapering to both ends; the flowers large, very short peduncled, and the bracts of the involucre in about three series—ovate, or narrow lanceolate, and attenuate-acute, ciliate on the margins and occasionally on the back. Indeed, the general appearance of the plant, its lateness in flowering, and general robustness enable us to draw the line with a good deal of certainty at *H. rigidus semi-plenus*, which I believe to be a garden creation, and the semi-double form of *H. rigidus elegans*. With regard to *H. giganteus*—a fine tall showy species, if one selects the best forms—our experience at the British Museum the other day may serve to illustrate the difficulty we have in getting at anything like finality with these variable plants. The Linnæan type in the British Museum, originally collected in Virginia by Gronovius, and published in "Species Plantarum," edition 2, is described as having linear, opposite, and sessile leaves, exactly representing the type specimen, while in all the other specimens, as well as in the cultivated forms, the upper leaves are distinctly petioled, and always alternate, the lower only being opposite. The name *giganteus* is, however, a good one for the plant, as it is the tallest of the

mid-autumn section; and Dr. Gray has so worded his later descriptions as to include very varied forms. It is said to be the Indian potato of the Assiniboine tribe of American Indians, and its edible tubers were long ago noted by Douglas. Some of the garden forms I have included under *H. divaricatus* may be hybrids between these two species; but as in their general characteristics they more nearly resemble *H. divaricatus* than *H. giganteus*, it will, I think, be more convenient to have them together under the former species. *H. giganteus* is a very variable plant, nearest to *H. Maximiliani*, but in typical forms easily distinguished by its more branching habit, its scattered longer-stalked flowers, and broader, toothed, and petioled leaves, tapering to both ends and thinner in texture. The flowers are large, handsome, and starry; the ray-florets are pointed, and of a pale or rich deep yellow colour. The plant grows from 8 to 12 feet high, which I consider its only fault as a garden plant.

Typical forms of *H. Maximiliani* are not very well known even to American botanists, and there are very few records of any having been met with. It is found chiefly along river-courses and on grassy spots near the Missouri. The wild plant is very handsome, the flowers large, bright golden yellow, its narrow grey-tinted or hoary leaves taking away from it the coarseness which is characteristic of a few of the taller species. The garden forms bear a strong resemblance to *H. giganteus*, and, although easily confused, *H. Maximiliani* will be found to be sparingly, if at all, branched, the flowers being produced on short stalks in the axils of the upper leaves.

H. decapetalus, as we have it in gardens, is a very distinct and useful but variable plant. The best form I can find is that grown at Kew, which is the same as *H. decapetalus sulphureus* (Hort. Barr). This plant differs from all others in the genus in its flowers being at right angles with the stem, always looking one full in the face, of a pale sulphur yellow, $2\frac{1}{2}$ to 3 inches in diameter. It has a bushy habit, with broadly ovate leaves, and with the exception of having ten rays, as its name implies—twelve to fifteen being the usual number—it may readily be identified from descriptions.

Linnaeus, in his "Species Plantarum," 1764, took great pains to distinguish *H. multiflorus* from *H. decapetalus*, giving the habitat as Virginia; and considering its several varieties, and

also simplicity of nomenclature, I think we cannot do better than follow Linnæus. Dr. Gray, however, insists on its being a garden creation derived from *decapetalus*. In the Kew Herbarium, among the *H. decapetalus* forms, there is only one large-flowered specimen, which I should say was *H. multiflorus*. I do not see why, in this particular case at any rate, we should not use the name in the sense Linnæus intended. Between *H. multiflorus* and *H. decapetalus* there is a much greater distinction than between, for instance, *H. giganteus* and *H. Maximiliani*, *H. strumosus* and *H. trachellifolius*, *H. rigidus* and *H. lætiflorus*, or *H. decapetalus* and the garden forms of *H. divaricatus*. Going a little further, I should say that *H. multiflorus* and *H. decapetalus* are as distinct as any other two plants in the genus, taking those in cultivation only as our standard. (See figs. 9 and 10.)

H. tuberosus, the Jerusalem Artichoke, gives a striking instance of how names are corrupted. The name Jerusalem, which has puzzled many in its connection with this plant, is simply a corruption of the Italian *girasole*, which literally means Sunflower.* *H. tuberosus* was introduced to this country about 1616, and was first found by Columnæ in the garden of Cardinal Farnese at Rome, and named by him *Aster peruanis*. This plant, which has changed somewhat by cultivation, has evolved from what Dr. Gray in his early Floras called *H. doronicoides*, and which I now believe to be the *H. doronicoides* of many gardens. The true *H. doronicoides* was described by Dr. Gray in his early editions as *H. cinereus* var. *Sullivantii*, and it was only recently that a comparison with Lamarek's type of *H. doronicoides* showed the plants to be identical. As I have stated above, there is a suspicion that our *H. doronicoides* may be the wild *H. tuberosus*, however much the plants may differ. The similarity in habit of growth, the lateness in flowering, and the height I take collectively as arguments in favour of this view.

H. divaricatus, as we have it in gardens, is very far from being typical. In wild specimens the leaves are narrow, sessile, or nearly so, opposite and horizontally divaricate—hence the name.

* This derivation of the name "Jerusalem Artichoke" is, however, disputed, vide *Gardeners' Chronicle*, vol. ix., 1891, p. 151; vol. x., 1891, pp. 482, 526, 650, 707.—[Eds. J. R. H. S.]

There is one specimen in the British Museum labelled "*divaricatus* from Rochester," with slightly stalked leaves, but this may be one of the hybrids Dr. Gray has called *H. ambiguus*. All the Kew plants, although having distinctly stalked leaves and sparingly branched stems, may be distinguished by their leaves being opposite quite to the top, somewhat appressed, scabrous, and serrulated; the flowers orange-yellow, smaller than *H. decapetalus*, and opening at least a fortnight earlier.

Of *H. orgyalis* (fig. 8, p. 37) and *H. angustifolius* I need say little here. Both are comparatively rare plants, and both are extremely graceful, and in warm summers flower freely.

H. occidentalis always reminds one of a poor *rigidus*, and *H. mollis* is more distinct than handsome.

Before closing I would like to say a few words about the near allies of the Sunflowers. It seems somewhat strange, considering the number of Helianthus in cultivation, and their value in the autumn garden, that efforts have not been made to introduce some few of the neighbouring genera. The *Gymnolomias*, for instance, are graceful and extremely pretty plants; the *Helianthellas*, of which we have only one species in cultivation, *H. uniflora*, and which we find a most interesting and useful rock-plant; and lastly, the *Wyethias*, most of which are large-flowered showy plants. I feel sure if we made an effort our American friends would help us in the matter.

SYNOPTICAL KEY TO GARDEN SUNFLOWERS.

§ *Involucral bracts short, ovate-obtuse or acutish.*

H. rigidus, Desf. type.—4 to 4½ feet high; stem scabrous or hispidulous; upper leaves alternate, broadly lanceolate, distinctly 3-nerved and veined; the lower opposite, thinner, sparsely serrated, and somewhat acuminate, narrowing to a winged petiole; bracts of the involucre short, ovate-acute, and somewhat spreading; heads showy, bright yellow; disc yellowish. (372, 381,* *pubescens*, Barr, flowers a fortnight or so later than var. *æstivus*.) Plains and prairies, West Georgia, Texas, Colorado, &c.

* The numbers throughout refer to the specimens growing at Chiswick, and are retained only for the convenience of the Nomenclature Committee.

H. rigidus, var. 1, *æstivus*.—Stem 3 to 4 feet high, scabrous; upper leaves lanceolate, somewhat obtuse, thick, coriaceous, almost entire, hispid or scabrous, margins hispid, distinctly 3-nerved, indistinctly veined; lower ovate-lanceolate, tapering to both ends, alternate, or sometimes opposite or verticillate in threes; petiole winged and somewhat clasping at base; involucre of about four rows; bracts ovate, somewhat obtuse, densely appressed, and minutely ciliate; flowers on long leafless petioles; ray florets $\frac{1}{2}$ to 1 inch long, golden yellow; disc purplish. (323, 340, 355, 359, *japonicus*; 363, Hort. Ware.) The first of the *rigidus* forms to flower. Flowers early in August.

H. rigidus, var. 2, *grandiflorus*.—About 5 feet high; stems usually purplish, scabrous; upper leaves alternate or opposite, entire or slightly serrate, hispid, scabrous, more or less acuminate; involucre bracts ovate-acute, somewhat squarrose in old flowers; disc purplish; flower large, showy. (327, Green-stemmed; Dod, 327; *doronicus*, 329, 379; *strumosus*, Paul, 352; *strumosus*, Barr, 366.)

H. rigidus, var. 3, *elegans*.—Stems green or purplish, scabrous, 6 feet high; upper leaves lanceolate, alternate, thinner than the last, slightly serrate-acuminate; lower broadly ovate, tapering to both ends, serrate, opposite or alternate; flowers large and showy; rays orange-yellow, $\frac{1}{2}$ to 1 inch long, narrow; bracts of the involucre short, ovate-acute; disc purplish; flowers end of September. (319, Chiswick, *rigidus elegans*, Kew, Barr, 385.)

H. rigidus, var. 4, *latifolius*.—Stems 6 to 7 feet high, smooth or slightly hispid; upper leaves lanceolate, entire, coriaceous, alternate, barely stalked; lower leaves ovate-lanceolate, obtuse-serrate, and distinctly short-stalked; bracts of involucre ovate-acuminate, appressed, margins ciliate; rays broad, little over an inch long, deep yellow; disc yellowish. (343, *latifolius*, Dickson.)

H. rigidus, var. 5, *semi-plenus*.—Stems about 5 feet high, stout, hispid; upper leaves broadly linear, entire, thick, coriaceous; the lower ovate, tapering to both ends, and shortly but distinctly stalked, entire or sparsely serrate, 3-nerved, veins prominent; rays orange-yellow, ovate-lanceolate, numerous, 1 to $1\frac{1}{2}$ inch long; disc purplish; bracts of the involucre ovate-acuminate, margins minutely ciliate. (*H. latiflorus*, Paul, 356; *angustifolius*, 374; *latiflorus*, Barr, 389.)

§§ *Involucral bracts half as long as in the last section, ovate-lanceolate, acuminate or attenuate-acute.*

H. latiflorus, Pers.—Stem stiff, scabrous or hispid, 6 to 8 feet high, very leafy to summit; upper leaves opposite or alternate, thinnish, dark green, entire or coarsely serrate or toothed; lower 9 to 12 inches long, broadly ovate-acuminate to both ends, and distinctly stalked, 3-nerved, distinctly veined; bracts of involucre of three to four series, lanceolate-acuminate or attenuate-acute, hirsutely ciliate, 3 to 4 inches long; ray florets numerous, 2 to 2½ inches long, nearly ovate-lanceolate, bright yellow; disc yellow. The roots are similar to but with longer runners than any of the *rigidus* forms. Prairies and barrens, Indiana, Illinois, Wisconsin. (371, *latiflorus elatior*, Barr. May be *tricuspis* of Torr and Gray.)

H. occidentalis, Riddell.—Stem slender, 2 to 3 feet high, branched, hispid, leafy usually near the base only; radical and lower leaves ovate-obtuse or lanceolate-oblong, somewhat coriaceous, entire or slightly serrated, distinctly 3-nerved and stalked; heads mostly solitary, on longish peduncles; ray florets orange-yellow, 1 inch long, ovate; disc yellow; bracts of the involucre lanceolate-acute, hispid. This species resembles the true *H. atrorubens*, and differs chiefly in the involucral bracts. Prairies and Oak-barrens in dry ground, Michigan to Kentucky.

H. mollis, Lam.—Canescent or hoary throughout; stems 3 to 4 feet high, branched almost from the base, grey-green, densely hairy, very leafy; leaves all opposite, or a few of the upper alternate, ovate, with a cordate or clasping base; bracts of the involucre lanceolate-acute, hoary or villous; flowers rather large, yellow; disc yellow. Flowers late August. Dry barrens, Ohio to Iowa, and south to West Georgia and Texas. (*Bot. Mag.*, t. 3689).

H. lævigatus, Torr and Gray.—Rootstock not creeping; stems 3 to 5 feet high, branched, deep purple, smooth, and usually glaucous; leaves all opposite or the upper alternate, sessile or subsessile, lanceolate-acute, entire, serrulate, or mostly entire, reticulately veined, 3-nerved; bracts of the involucre lanceolate-acuminate; flowers bright yellow; ray florets 6 to 8 in number, about an inch long. Alleghany Mountains in Virginia and North Carolina.

H. doronicoides, Lam.—Stems 5 to 8 feet high, densely pubescent and scabrous; leaves opposite, or the upper ones alternate, ovate, tapering to both ends, sessile, serrated, rough on both surfaces; flowers most crowded, on short peduncles; bracts of the involucre lanceolate-acute, ciliate on back as well as margins. Late-flowering species. (*Tuberosus* hybrid, Dod; *cinereus* var. *Sullivantii*, Torr and Gray; *pubescens*, Hook, *Bot. Mag.*, t. 2778.) Dry ground, Ohio to Missouri.

§§§ *Involucral bracts nearly as long again as in the last, section loose, somewhat squarrose, lanceolate-subulate, or gradually attenuate from a narrow base.*

H. angustifolius, L.—Stems 2 to 5 feet high, scabrous or hispid, slender, and sparsely leafy; leaves thick, entire, with somewhat revolute margins; upper stem-leaves sessile, linear-lanceolate, slightly narrowed at base, from 1 to 7 inches long and 2 to 4 lines wide, shiny dark green above, paler and smooth beneath, opposite or mostly alternate, the lower and radical leaves more lanceolate; bracts of the involucre linear-lanceolate, acute or attenuate-acuminate, margins ciliate; ray florets generally about 18 in number, an inch long, orange-yellow; disc black-purple. (*Bot. Mag.*, t. 2051. *Coreopsis angustifolia*, L.; *Rudbeckia angustifolia*, L.; *Leighia bicolor*, Cass.) Wet ground; Pine-barrens, New Jersey and Kentucky to Florida and Texas.

H. orgyalis, D.C. (fig. 8).—Stems 6 to 10 feet high, smooth and glabrous, purplish, glaucous, very leafy to the summit; leaves alternate, narrow, linear, acute, entire or obscurely serrate, recurved, 6 to 12 inches long, thin, glabrous; the lower ones narrowed into a petiole; flowers deep golden-yellow; ray florets an inch long; disc purple; bracts of the involucre linear-attenuate, loose, more or less squarrose, reaching up to half the length of the rays; margins minutely ciliate. Dry plains, Nebraska to Arkansas and Texas, west to S.E. Colorado.

H. grosse-serratus, Martens.—Stem smooth and glaucous, 7 to 9 feet high; leaves lanceolate-acuminate, coarsely serrated, green above, woolly beneath, stalked; lower leaves opposite, upper alternate; ray florets 1 inch long, deep yellow; bracts of the involucre slender. A very distinct late-flowering species. Dry plains and prairies, Ohio to Dakota, Missouri to Texas.

H. giganteus, L.—Stems 10 to 12 feet high, purplish, glaucous, and slightly scabrous, branched from about the middle; lower leaves lanceolate, tapering to both ends, stalked, opposite, serrated, and scabrous on both surfaces; upper shortly stalked, or with winged petioles; bracts of involucre lanceolate, attenuate, acute, ciliate on back and margins; ray florets deep yellow, somewhat pointed, 1 to 1½ inch long; disc purplish. (*decapetalus sulphureus elatior*, Hort. Barr; *trachellifolius*,



FIG. 8.—*HELIANTHUS ORGYALIS*. (From the *Dictionary of Gardening*.)

Hort. Barr; *giganteus superbus*, Hort. Barr; *Maximiliani*, Dod.) Moist or wet ground, Canada, Alabama, and Louisiana.

H. Maximiliani, Schrader.—Stems scabrous, 7 to 8 feet high; leaves nearly all alternate, rigid, lanceolate-acute, or acuminate, nearly sessile and entire or slightly serrate; heads large, produced on short peduncles, mostly in the axils of the upper leaves; bracts of involucre lanceolate-acute, somewhat rigid; ray florets 1 to 1½ inch long, golden yellow. Rich prairies and plains; west of the Mississippi, Texas, &c.

H. divaricatus, L.—Stems simple or branched near the

summit, 4 to 6 feet high; leaves ovate-acuminate, stalked opposite and decussate, and usually appressed; stems smooth or scabrous, green or purplish; bracts of the involucre half as long as the rays, linear-acuminate, margins ciliate; ray florets 1 to $1\frac{1}{2}$ inch long, orange-yellow, acute; disc yellow. (*Diversifolius* and *hispidulus*, Ell.; *butaris*, Hort. Dickson; *tuberosus*, black-stalked, Dod; *decapetalus niger*, Hort. Barr.) Dry or moist soil, Ohio to Wisconsin and south to Georgia and Texas.

H. decapetalus, L. (fig. 9).—Bushy stems 4 to 6 feet high, branched, smooth below, scabrous above; upper leaves broadly ovate-acuminate, lower much broader, opposite, stalked, thinnish, glabrous above, scabrous beneath; bracts of the involucre linear-acute, sometimes foliaceous, ciliate; ray florets 12 to 14 or more, 1 to $1\frac{1}{2}$ inch long, sulphur yellow; the heads usually at right angles with the stems; disc yellow. (*Tuberosus*, Dod; *decapetalus sulphureus*, Barr.; *Bot. Mag.*, t. 3510. Banks of streams and moist woods, Canada, Illinois, Georgia, &c.

H. multiflorus, L. (fig. 10).—Stems 3 to 5 feet high; leaves larger, firmer, and more ovate than in *H. decapetalus*, cordate, stalked; flowers rich yellow, 2 to 5 inches in diameter; involucre bracts lanceolate, foliaceous. *Bot. Mag.*, t. 227. (Var. *maximus*, a much taller form, with larger and finer flowers, and more pointed rays; *multiflorus major*, Hort. Var. *fl. pl.*, 3 to 5 feet, like the type, but with outer ray florets large, and the disc florets ligulate, double; *multiflorus major pl.*, Paul. Var. *Soleil d'Or*, in which the flowers are all quilled like an Aster. Var. *Bouquet d'Or*.)

H. tuberosus, L.—3 to 14 feet high, stem stout, hispid; leaves alternate, ovate, or subcordate-acuminate, serrated, scabrous on both sides, and usually stalked; ray florets 12 to 20, often 1 to $1\frac{1}{4}$ inch long, yellow; bracts of the involucre lanceolate, attenuate, acuminate, hirsute. Moist alluvial ground, Upper Canada, Arkansas, and Georgia.

DISCUSSION.

The Rev. C. WOLLEY DOD said that he quite agreed with Mr. Dewar that the account given by botanists of the history of *Helianthus multiflorus* is not quite satisfactory. The plant exists in various forms, single and double, which are not con-



FIG. 9. - *HELIANTHUS DECAPETALUS*. (From the *Gardener's Chronicle*.)

FIG. 10. HELIANthus multiflorus. (From the Gardeners' Chronicle.)



nected, as far as we know, in gradation. Between the supposed type of the species, *H. decapetalus*, and the nearest known form of *H. multiflorus* there is a wide gap. It had always seemed probable to Mr. Dod that *H. multiflorus* is a garden hybrid of *H. annuus* and perhaps *H. decapetalus*, and that it has been produced several times. *H. annuus* is the only known Sunflower besides *H. multiflorus* which assumes double forms, and its hybrids might inherit this tendency. Mr. Dod had also more than once drawn attention to the fact that *H. multiflorus* is invariably barren, making only empty achenes. Could anyone say that he had ever raised a seedling from it? Perhaps we may some day have more certain evidence by the suggested cross being effected artificially.

THE CULTURE OF SUNFLOWERS.

By Mr. E. H. JENKINS, F.R.H.S.

IF one may be permitted to form an opinion of the cultural requirements of Sunflowers by the frequency with which they occur in cottage and wayside gardens in almost all parts of the country, it is not unlikely that the general conviction would be that their culture is very simple; and, indeed, this is quite in accordance with the facts of the case. In not a few gardens of my acquaintance are these showy herbaceous plants allowed to come and go year by year just as they will, and to annually produce their quota of flowers, without receiving any attention beyond the removal of the flowering stems when these have finished their season's work. But in reality this is not cultivating the Sunflower at all, and may perhaps be better described as a test of their powers of endurance. Still there are, however, certain phases in gardening where this let-alone system may be tolerated—such, for example, as the wild garden or the woodland, in either of which places it would certainly be productive of good results; but, on the other hand, when it is desired to associate such things with the usual hardy herbaceous plants in the borders or beds, some little attention to their wants will become necessary. Indeed, in common with other plants, if we would do justice to these flowers and have them in perfection, then

cultivation becomes an essential as well as a primary consideration. Too frequently, however, are we as cultivators of these plants prone to allow them to do what they will in the way of flowering (and particularly is this so in the case of those plants that naturally produce an abundance of flowers) without making an effort to discover any special feature or worth that individual kinds may perchance possess, and we are rather content to let them in a very great measure have too much their own way. This, however, is a mistake, and one we may with advantage rectify, since it is only natural to assume of any plant that yields an abundance of flowers with only ordinary care that its maximum may readily be forthcoming with a somewhat more liberal treatment accorded it. Of very few plants indeed is this more true than of Sunflowers, which in a large number of instances produce their flowers in rich abundance and profusion during the late summer and autumn months, when they constitute quite a feature in our gardens. Many of the perennial kinds, and notably the varieties of *H. multiflorus*, although very old inhabitants of our gardens, can hardly be said to have attained to anything like popularity till some dozen years or so ago, when the so-called æsthetic taste for single flowers gave to these plants, among many others, a sort of impetus as it were, that made them popular with a large number.

At that time the demand for plants was much in excess of what it had been previously, and I well remember being driven to extremes to propagate them in sufficient quantity; but the exigency of the case was met in a manner I shall presently refer to in dealing with their propagation.

Much of this popularity they still retain—that is if we may judge by the hundreds of plants that are sold annually by the leading cultivators of hardy plants; and, coupling with this the fact that Sunflowers are by no means delicately constituted, one can only imagine, what I have reason to believe is the case, that their cultivation is gradually extending to a large number of amateurs and others who a few years ago barely knew of their existence. But even if the taste for these flowers were on the decline, the Conference of to-day, so admirably supported by the grand collection of these plants which for some time past have been flowering in the Society's gardens, would more than satisfy all doubt as to their utility and general worth. Such a

collection is of considerable importance, and I doubt not that many, and myself among the number, have been benefited by inspecting them. But let us now see what are some of the adaptabilities of these Sunflowers. First and foremost undoubtedly their greatest value is in the flower garden, and whether this be in the herbaceous border proper or in beds devoted wholly to them on the lawn, where they would shine forth in all their brilliancy, matters but little, as they are well suited to either. Some of the giants of this fine race of plants, as, for example, *grosse-serratus*, *giganteus*, *multiflorus-maximus*, and others, would be productive of excellent results in the shrubbery, and, given room for development, would tend to brighten a department in our gardens which is not unfrequently of too sombre a hue. In like manner may the forms of *H. rigidus* be all employed for this and similar purposes.

One very important item, and one too often overlooked, is the suitability of some kinds to town gardens and smoky districts generally; especially is this true of the *multiflorus* group. All these are possessed of a vigorous habit and great freedom of flowering, the latter coming at a time when flowers in town gardens are none too plentiful. Therefore I urge upon all who have such gardens not to forget the great value of Sunflowers for this purpose; free-flowering and smoke-resisting plants are by no means common. Then, again, I would like to see them figure far more conspicuously than they do at present in our large public parks and gardens, for in such places plenty of scope exists, and large beds may be devoted entirely to them. Moreover, they are so extremely accommodating in several ways that it is a matter for regret as well as surprise that their value as bedding plants has not received greater recognition hitherto. For this purpose they may be allowed to attain their full height, or by adopting the dwarfing process their height may be reduced just one half. For my own part I am much in favour of the dwarfing process, not from any desire to thoughtlessly curtail the stateliness of any plant, but because I believe a far wider field for usefulness is thereby insured—*e.g.*, an amateur with a small garden may refuse to give place to a plant, however free-flowering or decorative, knowing that its usual height is five or six feet; yet the same amateur, knowing that by a simple process this height could be much reduced, may possibly avail

himself of the opportunity. By cutting the plants down to within six inches of the ground (or at least sufficiently low to allow the plants breaking freely away again) in the first week of June, fine masses of their flowers from two to three feet high would be secured, and beds such as these would be very telling, while exactly the same course may be pursued with solitary examples. The best kinds for this purpose—*i.e.*, the dwarfing process—are *H. multiflorus* and its varieties. One species in particular—*viz.*, *H. orgyalis*—should, I think, be always treated separately, and be grown in isolated positions, either on the lawn or in any open spot where it could be seen to advantage.

It is by far the most graceful of all Sunflowers, attaining to fully ten feet high when well established ; but to obtain such fine examples they should be left undisturbed for years when once properly planted. There is nothing particularly showy in the flowers of this species, for these, though numerous, are very small ; but in the beautifully recurved and linear leaves exists a grace quite unique. And here I may be allowed momentarily to diverge from my path to point out the existence of an error as to the introduction of this plant from the United States. This is given in the “ Dictionary of Gardening ” as 1879 ; but I made the acquaintance of the plant myself in 1872 in Mr. Parker’s nursery at Tooting, where a noble specimen existed, which must have been eight years old at least. I am not, however, in a position to state the exact time of its introduction, but the plant is included in Mr. W. Robinson’s catalogue of hardy plants for 1871, and also in Mr. Ware’s list of perennials for the same year. So that the “ Dictionary of Gardening ” is obviously in error respecting it.

But to return. Only one more item remains to be mentioned as concerning the adaptabilities of these Sunflowers, an item known to most people, *viz.*, their great usefulness in a cut state. Coming at a season, too, when harvest festivals are abundant, their flowers are of great service in these decorations, and country and village church alike invariably has its share.

And now let me pass on to note briefly the soil and general treatment that these Sunflowers prefer. We all know them to be, for the most part, stout, free, vigorous-growing plants, such as may be accommodated in almost any soil, with perhaps one exception, namely, soil that is very hot and

sandy and has a deep sandy subsoil, in which, unless the season be exceptionally wet, Sunflowers will not succeed unless special means are adopted. In all sorts and descriptions of loam, including those that are clayey and somewhat retentive, the majority of them are perfectly at home, growing luxuriantly with but little care. The stoloniferous kinds, however, appear to carry on their wanderings a little more freely in light than in heavy soils, an advantage where they are planted in shrubberies or for purposes of naturalisation, but the reverse when occupying the select border, as in one season they not unfrequently get quite three feet, and even four feet, from the spot in which they were originally planted. But for this single fault we must not banish them from the select border, for their golden flowers are particularly showy in summer-time, and the best and only way out of the difficulty is to replant these kinds every year in March or April, selecting the strongest of the buds that have formed at the extremities of the stolons and planting them in groups of twenty or thirty together. Such a group may be two or three feet across, or larger or smaller to suit individual tastes and requirements, and I find that finer flowers result from this treatment than is the case with those left to themselves, while at the same time a more showy and compact group is obtained. Where the same kinds exist in the shrubbery, it is advisable, annually in autumn when the stems are cleared away, to give a good mulching of thoroughly decomposed manure, or failing this liquid manure freely; this would prove of equal benefit to shrubs and Sunflowers alike.

It is worthy of note, I think, considering the great height to which many of the varieties attain, that they are very shallow-rooted even on good ground. *H. decapetalus* roots somewhat deeper than the generality, while the graceful willow-leaved *H. orgyalis* roots much the deepest of all, the roots and the woody rootstock being quite as distinct as its leaves and stems. This latter is the only kind that experience has shown to be benefited by allowing it to remain undisturbed for ten or even a dozen years. This species also takes longer to grow into a good-sized specimen than most of them. Never plant it near large trees, but in a perfectly open spot on the lawn in two or three feet of good soil. On the other hand, *H. multiflorus* and its varieties deteriorate considerably if left too long in one spot. Many

small inferior shoots are formed in the interior of the clump, which presently become overcrowded and perish.

But they are altogether more vigorous and produce a greater percentage of good flowers when divided and replanted every second year. In very severe winters the varieties of this group suffer from frost, and are sometimes killed outright, a large number of plants having succumbed to its severity during last winter. In the case of large specimens the centre is frequently killed completely, while the outer shoots remain comparatively sound and secure. Those remaining will be best lifted and replanted as soon as signs of renewed activity appear, giving them a fresh position wherever this is possible.

And now, in conclusion, let me say a few words concerning their propagation, a comparatively easy matter to all—so much so, in fact, that such kinds as *rigidus*, *latiflorus*, *doronicoides*, and indeed all those that produce underground stems and buds, will require nothing beyond what I have already suggested; while for the remaining species and varieties, or at least their greatest number, division of the root in early spring will be best for most amateurs and private growers. Nurserymen, however, have sometimes to adopt other means, when propagation by means of cuttings has to be resorted to. During a somewhat varied experience among hardy plants, I have rooted many hundreds of cuttings of these Sunflowers, an operation which has been rendered necessary by the demand for these fine golden flowers of summer and autumn.

This may seem somewhat overdone, but when I say that not only have I gladly availed myself of the young points, such as are usually employed for cuttings, but have been equally grateful for cuttings merely composed of single joints, it will be readily seen that these plants have been much in demand, or the stock has been very low, and truthfully it has been a little of both.

Twice in my experience have I had to go even further than this, and have been compelled to insert cuttings with single eyes—that is, making two cuttings from each joint. This is the mode I referred to in the early part of my paper, the varieties thus operated on being the forms of *H. multiflorus*. *H. orgyalis* may also be freely propagated by means of cuttings, first by securing its extreme point, and afterwards the young breaks that issue freely from the stem. The best propagating medium is a dung frame.

Some of those present may like to hear what progress cuttings make, and particularly those having "single eyes" only; and my reply is that they make plants quickly and flower within six months of the cuttings having been inserted—provided always that they are planted out as soon as rooted and duly hardened off, and not allowed to remain in the store pots to starve, and therefore lose valuable time.

It is surprising, too, what a large number of good flowers individually are produced during the first season by these plants from cuttings when accorded liberal treatment.

It now only remains for me to mention some of the best kinds for general use. These are the varieties of *H. multiflorus*, which include *major*, with finely formed flowers; *maximus*, also called *grandiflorus*, with lighter yellow flowers and more pointed petals; *multiflorus fl. pl.*, and *grandiplenus*, also known as Soleil d'Or. These are all excellent, but the last-named has rich orange-coloured flowers, and in form partakes more of a Cactus Dahlia. It is not improbable that this is a sport from the ordinary double form, as I have repeatedly had flowers identical with Soleil d'Or on plants of *multiflorus pl.*, and once or twice I have had flowers wherein the characters of both varieties have been displayed, but in no case did these remain constant.

Other good kinds may be found in *orgyalis*, *rigidus*, *lætiflorus*, *decapetalus*, *occidentalis*, *doronicoides*, *divaricatus*. *Heliopsis lævis* is a most desirable species with rich orange flowers. All these are worthy the attention of cultivators, and some at least should be grown in every garden.

DISCUSSION.

The Rev. C. WOLLEY DOD said that he was rather disappointed that nothing had been said about the hybridisation of the Sunflower, as he felt no doubt that hybrids of it might with advantage be raised in gardens. There is an annual species called *H. cucumerifolius* in common cultivation; its flower is very good, being of moderate size, bright in colour, with a very black disc. Mr. Dod had formerly raised several good hybrids from this, but they had died out without producing good seed. In 1890 a friend of Mr. Dod, living at Twyford, had artificially raised a very fine hybrid between *H. annuus* and *H. cucumeri-*

folius, which had produced a few fertile seeds. He sent Mr. Dod twelve of these, all of which grew and flowered. They divided themselves into the habit and flower—six of *H. annuus* and six of *H. cucumerifolius*—though no plant could be called typical of either. One was completely double, which was more remarkable as Mr. Dod's friend assured him that he had never had a double annual Sunflower in his garden. Mr. Dod thought that if some of the better perennial kinds were fertilised with the pollen of *H. cucumerifolius*, perennials of improved character might be obtained.

AUTUMNAL TINTS.

By Mr. HARRY J. VEITCH, F.L.S., F.R.H.S.

[Read October 27, 1891.]

WHEN I was asked by the Council of the Royal Horticultural Society to read a paper to-day, a subject was suggested very different from that which I have selected. Remembering that this season of the year gave us the enjoyment of the beautiful tints we see in every direction, and perceiving, as I have long done, that those who plant trees and shrubs for ornamental purposes, more especially the deciduous kinds, often overlook the splendid results that may be obtained by planting for foliage-effects for this season of the year, I have selected the present subject in the hope that it may lead to more consideration on the part of those interested in beautiful trees and shrubs.

The beauty and marvellous variety of the autumn tints of our woods and hedgerows have been the theme of many a poet's song, and have furnished a subject for eulogy from early times; for who, on a bright autumn day, can look upon the delicate gradations of colouring in the foliage of the deciduous trees and wayside shrubs with indifference, and not feel the force of the poet's impressive lines—

But see the fading many-coloured woods,
Shade deepening over shade, the country round
Imbrown, a crowded umbrage, dusk, and dun,
Of every hue from wan declining green
To sooty dark. These now the lonesome Muse
Low whispering, lead into their leafstrown walks,
And give the season in its latest view.—THOMSON.

Such is the general view presented by our sylvan trees and shrubs in late autumn. Particular scenes may affect the beholder in a different manner. One view may be vast and impressive, as the clouds of gold presented by the Elms in Windsor Great Park and elsewhere, or the lovely russet-brown shown by masses of Beech; or, again, the rich, almost amber gold of the Horse-chestnut, the one following closely on the other in the time of its change of colour. Another view may be diversified as the contrast of the golden foliage of the Larch with the deep green of the Silver Fir so frequently to be seen in coniferous plantations. All are equally to be admired. Nor would our admiration be less excited if we look more closely at the objects around and examine a little in detail some of the changes that are taking place in the foliage of trees before it falls. Thus if we fix our attention for a moment on the leaves of some of our largest trees, as the Elm, the Beech, or the Lime, as they begin to change, we cannot fail to be struck with the surprising variety of their coloration. No two leaves are exactly alike in this respect; all are blotched, splashed, and suffused in every possible way with many shades of green, yellow, or russet-brown, and so on, till the final stage of uniformity is reached. Then, again, if we turn to the smaller trees and shrubs that line the hedges, almost infinite variety everywhere meets the eye; the leaves of the Hawthorn are tinted with red, brown, and yellow, the common Dogwood glows with purple, the Spindle-tree is recognised by its orange and brown tints, the Wayfaring-tree (*Viburnum Lantana*) changes to crimson and yellow.

Nor unnoticed pass
The sycamore, capricious in attire;
Now green, now tawny, and ere autumn yet
Hath changed the woods, in scarlet honours bright.—COWPER.

The phenomenon I have attempted to portray with the aid of a little poetic license is viewed in various aspects according as it affects each in his own sphere. To the artist its impression is purely æsthetic, an impression he transfers to the canvas for the gratification of the admirers of his art. The forester, on the contrary, generally regards the change from a practical point of view, as indicating the season for certain kinds of work to be done. To the agriculturist it is a sure sign of the near approach

of a season of inclement weather, which he cannot always look forward to without some apprehension. To these and the like "the Fall" is an annual recurrence, bringing with it its joys, its rewards, its pleasures, and, it may be, its apprehensions. But the student of Nature is animated by a different feeling from either. He asks, What are the causes at work in the great laboratory of Nature that bring about these ever-varied and beautiful changes in the colour of the leaves of trees in autumn? To obtain an answer to this question he employs the various methods of scientific investigation. Although I have no intention of attempting to grapple with so difficult a subject in its scientific aspect, I may be permitted to remark that it is undoubtedly a 'problem of absorbing interest which has not yet been fully worked out, so minute are the cells of the leaf in which the changes take place, and their contents so subtle as to elude the grasp of the most skilful investigator and to evade the most delicate chemical tests that have been applied. My present purpose is to give expression to a conviction I have long felt, viz., that we can also gain in our gardens and pleasure-grounds many similar and even more varied effects than such as I have attempted to describe, by careful and suitable selection from the materials at our disposal, and that striking leaf-pictures may be obtained at this season of the year by a judicious arrangement of the selected plants, not less pleasing to the eye than the bolder floral displays of summer.

Since, then, so much beauty and delicacy of colouring is to be seen in autumn in our native trees and shrubs, what additional effect is produced when the foliage of exotic trees and shrubs sufficiently hardy for our climate is joined to them, or intermixed with them?—or what new combinations of colour can we obtain from exotic trees and shrubs apart from our native ones? It is simply this: in the first case the effect is greatly heightened and intensified; in the latter, by selection, a brilliant display can be formed such as is quite unknown among British trees and shrubs, and to produce this is truly a part of the gardener's art. I quote a few instances recently and casually observed. At Coombe Wood a plant of *Acer palmatum sanguineum* stands in front of a common Birch; here we have a striking contrast in the colour of the Acer, which retains its sanguineous hue till late, with the silver bark of the Birch, and its foliage

changing from green into yellow; also in the stiff habit of the first with the gracefully drooping branchlets of the latter. Another splendid effect is obtained by allowing the Virginian Creeper and common Clematis to climb loosely over any large evergreen, as the Ilex Oak or common Holly; the deep green foliage of either forms a striking background to the scarlet and crimson of the Ampelopsis and the white feathery seed-vessels of the Clematis. Another particularly fine combination is the silver variegated Ivy on a wall intermixed with the red and purple of the Japanese Ampelopsis. Again, the Pontic Azalea, so much admired for its delightfully fragrant yellow flowers in spring, offers in autumn, when massed, a gorgeous display of glowing crimson; and a still more striking picture may be formed with a group of the beautiful *Parrotia persica*.

Of the wealth of materials at our disposal for the decoration of gardens and pleasure-grounds, and the endless variety of combinations and groupings that may be formed with them, ample evidence will be obtained by a visit to the Royal Gardens at Kew in the month of October. At Tortworth and Westonbirt in Gloucestershire, the effective arrangement of deciduous trees and shrubs, particularly of exotic kinds distinguished by the beauty of the autumnal foliage, has been the study of the owners of those noble residences for many years past, and in consequence one of the greatest charms of their surroundings is perceived at this season of the year.

I propose, then, to bring under your notice some trees and shrubs of exotic origin whose foliage is distinguished for its autumnal colours. I shall include among them some that are perhaps not so generally well known as they deserve to be. The list is confessedly a very imperfect one, for, unfortunately, the present season has not been a favourable one either for the development of the colours or for bringing specimens before you. Moreover, the subject is one that requires a more extended study in its horticultural bearings, and which should be continued through several consecutive seasons before anything like an exhaustive treatise can be drawn up. Let us hope, however, that a beginning is being made that may lead to results of an enduring kind. For the convenience of reference by the Fellows, now happily rapidly increasing in number, the following selection of trees and shrubs, with a brief description appended to each, is

arranged in alphabetical order; but it must be understood that my list by no means comprises all that might be named.

It will also readily occur to many that a considerable number of trees and shrubs are rendered particularly ornamental at this season of the year by their fruit, which in many species is produced in great profusion, and is rich and varied in colour—notably the species of *Cratægus*, *Cotoneaster*, *Pyrus*, *Rosa*, *Euonymus*, *Viburnum*, &c., and among evergreens our old favourite the Holly; also the *Skimmias*, and the pretty *Pernettya* from the Straits of Magellan. This is unquestionably the fact; but as it would somewhat complicate our present subject by introducing into it the berry-bearing trees and shrubs, I have preferred to confine my remarks to foliage and its colours.

The Maples occupy a foremost place among the trees planted for ornament. Their outline is always shapely, their aspect elegant, and their foliage in autumn changes to many shades of yellow, red, and brown that render them particularly attractive at that season. The European and North American Maples have long been planted for their ornamental qualities, and to these must now be added several fine species from Japan. I can here only specify some of those most characteristic for their foliage:—

Acer circinatum.—A low or medium-sized tree from North-West America, 20 to 30 feet high, with somewhat pendulous branches; the leaves are 7 to 9-lobed, and change to red and light scarlet in autumn.

A. Ginnala.—A very elegant species, of moderate dimensions, from the Amour region. The leaves are prettily cut, and change into various shades of yellow, purple, and bronzy brown.

A. japonicum.—A small tree, with 9 to 11-lobed leaves, of a remarkably fresh and pleasing green when first expanded in spring, and which pass into golden yellow in autumn.

A. palmatum.—A charming Japanese Maple, with almost endless variety of form and colour in its foliage; it has proved to be one of the most valuable plants for decorative purposes ever introduced, and is no less striking in its autumn than in its summer dress.

The type, *A. palmatum*, changes into many tints of rose, yellow, and russet-brown.

Of the varieties : *ampelopsifolium* is tinted with deep rose-purple ; *atropurpureum* and *sanguineum* pass into bronzy purple of the deepest hue ; *dissectum* and *palmatifidum* become orange and brown ; *flavescens* is exceedingly varied—shades of green, yellow, scarlet, and brown are intermingled in every possible manner ; *linearilobum* and *septemlobum* change to deep brownish green, with orange foot-stalks.

A. pictum.—An elegant Asiatic species, 20 to 30 feet high. As the specific name implies, the leaves have a varied colouring ; the clear bright brown into which all the colours subside is very distinct.

A. pennsylvanicum.—Well known as the Snake-bark Maple. A medium-sized tree (30 to 40 feet high), of which the leaves change into clear buff-yellow, with rose-coloured foot-stalks.

A. platanoides.—The Norway Maple and its varieties are among the best of trees for park scenery ; its beautiful yellow and brown tints are always admired. For the lawn the digitate and vine-leaved varieties afford all the beautiful tints of the species, with the addition of a more elegant foliage in summer.

A. rubrum.—The finest of all the American Maples for its autumn tints. Although a lofty tree in its native country, Professor Sargent describes its habit as slender, and therefore not taking up much room. The leaves change from their summer green into a deep crimson-red, which passes into many shades of red and orange till the yellow stage is reached.

Berberis.—The fine red tints of the leaves of the common Barberry are well known. Those of the variety *atropurpurea* are still more striking ; they become dark bronzy purple bordered with fiery red.

B. Thunbergii.—A dwarf Japanese species. The leaves are much smaller than those of the European Barberry, but more diversified in colour ; orange, yellow, and straw-yellow are prettily intermingled.

Betula alba atropurpurea.—The purple-leaved Birch. The dark leaves of this variety assume in autumn a colour that cannot be easily described in words, but which contrast beautifully with the purple foot-stalks and the clear brown bark of the shoots, freckled with white lenticels.

Castanea pumila.—The dwarf American Sweet Chestnut. Its

handsome foliage fades into rich shades of yellow, orange-yellow, orange, and sepia-brown.

Cercidiphyllum japonicum.—The light tints of the leaves of this interesting Japanese shrub contrast effectively with the darker hues of others. They change to light yellow suffused with different shades of rose.

Clerodendron trichotomum.—This fine hardy Clerodendron, which flowers profusely in September, is again rendered ornamental by the fading hues of its foliage—brownish crimson, red-brown, orange, and brown.

Cornus.—The foliage of all the Dogwoods dies off with pleasing colours in autumn, and they are worth planting for that character alone. Within the more restricted area of the lawn and garden the following should have a place :—

C. brachypoda.—A Japanese species of moderate size, with clusters of white flowers in the early summer. In the variegated form, also very handsome in summer, the green portion of the leaf changes to a greyish brown that is sometimes tinted with rose. The long crimson foot-stalks afford a fine contrast to the blade.

C. florida.—The flowers of this species are the handsomest in the genus. In the United States it is a low tree, from 20 to 25 feet high, and very distinct from our common Dogwood. The leaves change in autumn to various shades of green, brown, buff, and yellow.

C. stolonifera.—A shrub of from 5 to 10 feet high. The autumn hues are pallid but distinct; the leaves are coloured in various ways with light green, light yellow, and light rose.

Cladrastis tinctoria.—The Yellow-wood of the United States, sometimes seen in British gardens under the name of *Virgilea lutea*. The leaves turn to a rich golden hue, the veins at first remaining green, giving them a finely tessellated appearance.

Cratægus.—Most of the species give handsome autumn tints, notably *C. coccinea*, in which the leaves are reddish scarlet, blotched and spotted with blackish purple. It is a North American species, 20 to 25 feet high, very handsome also in flower and fruit.

Enkianthus campanulatus.—A Japanese shrub allied to *Pieris* and *Andromeda*, well worth a place in every collection of *Ericaceæ* (*Rhododendrons*, &c.). The bark of the young shoots

is bright crimson; the leaves change into many shades of red, yellow, orange, and brown.

Eucryphia pinnatifida.—This beautiful Chilian shrub, so much admired for its white Hypericum-like flowers in summer, is also ornamental in autumn with its orange and scarlet leaves.



FIG. 11.—K LREUTERIA PANICULATA. (From the *Dictionary of Gardening*.)

Euonymus atropurpureus.—A North American shrub, 7 to 10 or more feet high. The leaves, as the name implies, become very dark purple before they fall. *E. obovatus* has much larger

leaves than the common European species, that change into various shades of purple, rose, and yellow.

Hamamelis virginica.—Although surpassed in the beauty of its flowers by the Japanese species, should be retained in gardens on account of the very pure light tawny yellow of its autumn leaves. In the Japanese species the leaves die off a glossy orange-yellow, quite uniform.

Kölreuteria paniculata.—This old favourite, handsome at all times when in foliage, is particularly so in autumn. Its long midribs are bright orange; the leaflets are strongly tinged with orange and shaded with brown (fig. 11).

Leucothoë Catesbæi.—The *Andromeda Catesbæi* of gardens. The long acuminate leaves of this pretty flowering shrub change to a deep bronzy purple.

L. recurva.—A native of the Alleghany Mountains. A dwarfer plant than the better known *L. racemosa*, and worth cultivating for its autumn leaves, which, in sunshine, are a fine scarlet subsiding into claret-purple.

Liquidambar Styraciflua.—A medium-sized North American tree, 30 to 40 feet high. No foliage surpasses this in the depth and richness of its autumn colour, which is a deep sanguineous purple with here and there blotches of red (fig. 12).

Liriodendron Tulipifera.—One of the largest and noblest trees of the American forest. Its autumn tints are very pleasing—orange-brown, sometimes russet-brown mottled with yellow.

Oxydendron arboreum.—The tree *Andromeda*, as it is called, but properly the monotypic genus *Oxydendron*. The leaves resemble those of a Peach-tree, and change to glowing red.

Parrotia persica.—One of the handsomest of shrubs for its autumnal foliage; the leaves change from bright green to orange, golden yellow, and scarlet. It is a native of the Russian Transcaucasian provinces, and belongs to the family of the Witch-Hazels (*Hamameliads*).

Pavia flava, figured and described by Professor Sargent as *Æsculus octandra*.—An American species of Horse-chestnut, attaining a considerable size in some parts of the United States. The leaves die off a very pure light orange.

Prunus pumila.—A low shrub, 3 to 4 feet high, with white flowers and small blackish fruit, a native of the northern United

States. The leaves are small, changing into various shades of red and crimson.

Quercus.—Among the Oaks are so many fine trees remarkable for their autumn dress that space and time permit only the mention of a few of the most distinguished.

Q. coccinea.—The Scarlet Oak, so called from its glowing autumn tints. A noble North American tree, 50 to 70 feet high.

Q. conferta (panonica).—The Hungarian Oak. The summer green becomes suffused and mottled with yellow, and finally a light russet-brown. The leaves of this Oak are beautifully cut.

Q. laurifolia.—The leaves are long and narrow, which change



FIG. 12.—LIQUIDAMBAR STYRACIFLUA. (From the *Dictionary of Gardening*.)

Our cut represents the upper portion of a branch bearing male and female flowers.

to various shades of crimson, brown-crimson, and brown blotched with yellow.

Q. palustris.—The Marsh or Pin Oak of the Americans. Leaves amber-yellow, shaded with brown and tinged with crimson.

Q. rubra.—The Champion Oak of North America. A noble tree, with a large rounded top and spreading branches, well recognised by its dark-red leaves in autumn, especially after a frost.

Rhamnus alpinus.—The handsomest of the genus for its foliage, which changes to a deep metallic greenish brown. A small spreading shrub, about 4 feet high.

Rhus.—All the hardy species of Sumach are worth cultivating for their foliage alone, which for variety and brightness of colours in autumn is scarcely surpassed by any other genus of trees and shrubs.

R. Cotinus.—The Venetian Sumach, so conspicuous in summer with its long panicles of fleecy whitish-green flowers. The foliage remains on the shrub till late, and dies off red-purple.

R. cotinoides.—The American representative of the European *R. Cotinus*. Its autumn colours are among the most brilliant in the genus—scarlet, orange, rose, and yellow, intermingled in the most beautiful manner.

R. glabra, especially the variety *laciniata*, has very elegant foliage, which, when beginning to change, is a bronzy purple, afterwards heightened into orange-red, orange, and yellow.

R. Toxicodendron, or, the Poison Oak.—Its autumn colours are scarcely less brilliant than those of *R. cotinoides*, and include as many varieties and shades.

R. typhina.—The Stag's-horn Sumach is also well distinguished by its bright orange-red leaves before they fall.

Spiræa prunifolia.—Always admired in spring for its pure white double blossoms, is again ornamental in autumn with its glossy rose and crimson leaves.

Stuartia Pseudo-camellia is scarcely less handsome in autumn than when loaded with its beautiful flowers in spring. The leaves change first to deep crimson, and then pass through various shades of carmine, rose, and orange-rose into the final yellow stage.

Stephanandra flexuosa.—A Japanese shrub of recent introduction. It has long, slender, flexuose branches, with red and orange bark, and furnished with Fern-like foliage that in autumn changes into various shades of red, orange, and crimson before it falls.

Styrax Obassia.—The noble foliage of this remarkable Japanese shrub has a coloration peculiar to itself in autumn. The ground-colour becomes green-yellow, passing into bright yellow, with longitudinal blotches of red-brown between the veins.

Symphoricarpus vulgaris.—The variegated form of the Coral-berry, or Indian Currant as it is sometimes called, is a very pretty shrub the whole time it is in leaf. Its summer colours are green margined with yellow. In autumn the green changes to red-brown, the yellow persisting.

Viburnum.—Most of the deciduous species of *Viburnum* have handsome autumn foliage. Most worthy of notice are *V. plicatum*, the *facile princeps* of the hardy kinds for its flowers, and in autumn for its foliage, which is then a deep sanguineous purple; also *V. nudum*, an American shrub, 8 to 10 feet high, with a similarly rich autumn colour.

CLIMBERS.

Besides the well-known Virginian Creeper and the Japanese Ampelopsis, there are a few other climbers with handsome autumn foliage worthy of notice, and among them—

Akebia quinata.—A Chinese plant generally hardy in the south and south-west of England and in Ireland. The autumn colour of its leaves is quite unique—a bronzy brown-purple, the underside greyish green.

Actinidia Kolomikta and *A. ovata*.—The leaves of the first change to light yellow, the latter to light orange, the foot-stalks in both species being rose-colour. They form a pleasing contrast with the purple of the Ampelopsis.

THE UTILISATION OF RAILWAY EMBANKMENTS.

By the Rev. W. W. TYLER, B.D.

(Communicated.)

ACCORDING to *Whitaker's Almanack* we have in our British Isles no less than 19,800 miles of railway in active operation. It is beside our purpose to make any calculation as to the quickest time it would take any genius inspired with a love of travel to pass over every one of those miles; but having made many journeys which have covered a large proportion of the total mileage, we have often been set thinking about the localities which we pass through, and in this paper we propose to speak

of the immediate neighbourhood of the iron track on which we are sometimes hurrying along at the rate of fifty miles an hour. We of course notice, from time to time, very bare places which have been opened up for the sake of the useful stone, or sand, or gravel, which can be utilised elsewhere on the line for bridges, buildings, or other requirements. But far oftener we observe beautiful tracts of land, seldom very wide, but oftentimes extending to a considerable length, and apparently of very little concern to the company that owns them. When we ask as to the uses of these strips of land, two exclusive replies are the only solutions of our questions, viz., "Nothing" and "Hay." We ask, "Why nothing?" and "Why hay only?" Of course, where the land is very narrow indeed, or where the soil is too barren to grow anything, "nothing" is a reasonable answer; but on the sides of many hundreds of miles of railway there are thousands of acres of land, now lying dormant, which, under a judicious system of management, might be adapted for the production of some of the common necessities of life.

But let us see how the matter stands. It may be taken for granted that the localities in question would be unsuitable for the depasturage of any animals, however little they might be given to straying away. Still, at the many stations and crossings there are usually some signs of rural life in the shape of pig-sties and fowl-runs, where some enterprising station-master, or porter, needs some excitement for certain portions of the day when duty does not demand his attention. We have even seen the "busy bees" in fullest glee amongst the flowers of the garden contiguous to the station, and the hives close at hand; but we dismiss the bee as being sometimes troublesome, and to have a swarm of bees alighting upon an engine-driver, or even clustering upon a carriage, would not be the most agreeable sensations of a railway journey.

Speaking generally, there is but one great field of enterprise which would be likely to prove a successful speculation, and that is in the department of what we may call still life. Trees, shrubs, and the lowlier forms of vegetation cannot run away. Some of them, Strawberry plants for example, can be kept within a few inches of the surface of the soil; but even trees can be kept within prescribed bounds in all directions. And when we know that every acre of land is rated like other

parochial lands, however unproductive it may be, it seems very strange that where the possibility of profit exists some trial has not been made of economising the railway lands. If some syndicate were to organise a system for the utilisation of the thousands of acres now useless, we venture to prophesy that it would be a commercial success. The lands are certainly of the most varied character, and in the most diverse of situations, so that the proposed vegetation could generally be adapted to the soil to be cultivated. The lands, too, have every advantage of being private property. Trespassers are rigidly prohibited on most lines. The lands are not even of the semi-private character of the sides of canals, where anything eatable would, if missed, be probably ascribed to the predatory instincts of the beasts of burden, rather than to the more omnivorous tastes and prehensile habits of the lords and masters of the said beasts.

We have sometimes wondered how it is that some of the populace who have clamoured for the reclamation of waste lands, without any investigation as to the possibility of growing anything beyond the scantiest herbage, have not long ago cast their eyes over the lines of railway, and demanded some notice of their economical ideas in that direction. One leading statesman suggested "jam" as a capital investment, and the consequence has been that we have seen fields in Kent and other places turned into Currant orchards. This is only one sample, however, of what may be done. We have seen fields of Violets laid out for the same reason—viz., as a commercial speculation.

In the hands of a body of competent men who understood, on practical principles, what plants would flourish best in different localities, we have no doubt that success would ultimately crown their efforts, and instead of such enormous importations of fruits, herbs, and flowers, some portion at least could be produced at home. If the project only set a thousand men to work that would be better than nothing; and if the railway lands were farmed out at but ten shillings an acre, the revenue would be on many railways a considerable item. We need but suggest a few of the many plants which are available for cultivation. The list might certainly include espalier fruit-trees—Apples, Pears, Plums, &c.; more certainly the shrubby plants, like Gooseberries, Currants, and Raspberries; and most certainly Strawberries to any amount. None of these would

require continuous attention. A few times a year they would need the gardener's care in pruning, keeping clear of weeds, and so on; and if some of the culinary necessities were added to the list they would provide abundant occupation for the rest of his time.

And then what shall we say to such a fact as this? Our British plantations of Lavender and other useful flowers have gone the way of so many other things—viz., to France and other continental gardens. Why, nobody seems to know, except this, that, like most other cultivated plants, Lavender needed some attention; but being a plant requiring only a very little care, that little it did not get, and so it has emigrated to the lands of more careful gardeners.

We have also attended the early morning sales at Covent Garden Market, and noted the vast quantities of flowers which are introduced from other places across the water, many of which we could easily grow ourselves. We have to go to Holland for bulbs; they would be just as good if grown within fifty miles of London. Many of the best varieties of Daffodils, Irises, Narcissi, Anemones, and the like are already largely grown by specialists, and their system might be made a national one if we were not so indifferent about such matters.

We are always crying out that we do not do this, and we do not do that; and it is evident that, if shareholders were alive to their interests, their waste lands would yield them profitable returns, and a great deal more than at present. The subject is worthy of the attention of those who rejoice in railway dividends. Probably timid directors would mention the element of danger about such invasions of their embankments. It need not disturb any director or shareholder, as this objection, and others which might be suggested, would all be minimised in a systematic undertaking such as we have hinted at. If the various railway stations have been turned by speculators into huge advertisement depôts, so that it is almost a puzzle to discover the name and place of the usual arrangements of a station, there would be some compensation for what we have to endure in the intervals of arrival and departure if the travelling hours were lightened by some pleasing sights of useful life, or refreshed by the fragrant breezes from a few acres of Violets, Strawberries, or Lavender.

One of our English sayings, trite and threadbare as it is, is,

that that man deserves well of his country who makes two blades of grass grow where but one grew before. On the same principle, the directors who can make it their business to produce a handsome return of flowers and fruits where "only hay," and that almost worthless, grew before, may certainly expect to be credited with the laudation of their shareholders as well as of their clients, the travelling public.

FRUIT PAMPHLET.

IN 1891 the Society issued a pamphlet (reproduced in the *Journal*, Vol. XIII., Part 3, p. 411) setting forth the best varieties of Apples, Pears, Plums, Damsons, Cherries, Raspberries, Currants, Gooseberries, and Strawberries worth the gardener's attention in England. The pamphlet was recommended chiefly to cottagers and small farmers, and met with such an enthusiastic reception that over 53,000 copies were distributed in a few months. A revised edition has now been prepared specially for cottagers and small farmers in Scotland.

FRUITS FOR COTTAGERS AND SMALL FARMERS IN SCOTLAND.

Attention having lately been directed to the advantages which may be gained by a more general and more careful cultivation of fruit, the Council of the Royal Horticultural Society have requested their Fruit Committee (which consists of forty of the leading experts in fruit culture in this country) to prepare a list, for the information of cottagers and small farmers, of those varieties which they would recommend as being most suitable for the purpose.

In preparing the list the Committee were particularly requested—

(i) To consider the matter entirely from a cottager's or small farmer's point of view ;

(ii) To make it applicable, as far as possible, to the whole of Great Britain ;

(iii) To include in it none but varieties possessing the four most necessary characteristics of quality, fertility, good growth, and hardiness; and

(iv) To attach such short notes as were thought desirable.

By order of Council, W. WILKS, *Secretary*.

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VARIETIES OF FRUITS FOR SCOTLAND.

Note.—(i) The lists are arranged in alphabetical order, and not in order of merit.

(ii) Before deciding which variety to choose, read the whole list through carefully, with the notes which follow each sort.

(iii) The months following the names indicate the season at which the particular variety is in perfection for use. It may, of course, be used earlier or kept later; it will vary slightly with each varying year, and will be somewhat later in the North than in the South and West.

APPLES FOR COOKING.

1. *Alfriston* (January to April).—A fine late-keeping variety, very hardy and prolific.

2. *Blenheim Orange* (December to March).—This is an excellent all-round Apple, but those who plant standards of it must be prepared to wait some years for them to begin fruiting. It comes sooner into bearing when grown as a bush tree. It is also a good dessert Apple.

3. *Ecklinville* (September to December).—The best of the Codlins; larger and better than No. 4; vigorous, hardy, and prolific.

4. *Keswick Codlin* (August to October).—A well-known early Apple, and very hardy.

5. *Lane's Prince Albert* (December to April).—One of the finest keeping Apples; bearing so abundantly that the weight of fruit often brings the branches down within the reach of cattle, and is therefore best as a bush tree.

6. *Lord Suffield* (September and October).—A very fine Codlin for a warm, light, stony soil, but liable to canker on cold soils.

7. *Lord Grosvenor* (October and [November]).—A robust grower and great bearer; more generally reliable than No. 6.

8. *New Northern Greening* (December to March).—A most

valuable late Apple for the Midlands and North Country, where it grows more vigorously than No. 5.

9. *Potts' Seedling* (September to November).—Very large fruit; compact growth; succeeds better in town gardens than any other.

10. *Stirling Castle* (October to January).—Hardy and very fertile; best as a bush, as it bears too abundantly to support itself as a standard.

11. *Warner's King* (December to February).—Very hardy and prolific; fruit of enormous size; best in warm, light soils, but good everywhere.

12. *Wellington* (January to May).—Hardy and prolific; lasts sound and fresh till May.

APPLES FOR EATING.

1. *Cox's Orange Pippin* (November to January).—The finest eating Apple; best as a bush, and likes a warm place.

2. *Duchess of Oldenburg* (September to November).—Hardy and very prolific.

3. *Duke of Devonshire* (March to May).—Hardy and prolific; best as a bush; the best of very late dessert Apples; the fruit should be left on the tree as late as possible.

4. *Irish Peach* (August).—Best as a bush or half-standard; must be used quickly.

5. *Kerry Pippin* (October and November).—Hardy and prolific; makes a fine bush or half-standard.

6. *King of the Pippins* (October to January).—Best as a bush; likes a warm place; a sure and abundant bearer.

7. *Red Quarrenden* (August and September).—Best as a bush or half-standard.

8. *Worcester Pearmain* (September to November).—Very hardy and prolific.

Note.—All eating Apples are best grown as bush trees; but in really good Apple soils, all the above may also be grown as standards.

PEARS FOR EATING.

1. *Beurré d'Amanlis* (October).—Large and well-flavoured; succeeds as a standard.

2. *Doyenné du Comice* (November and December).—The best of all Pears, but should be grown on a wall or fence.

3. *Hacon's Incomparable* (December and January).—Hardy and prolific; fine as a bush or standard.

4. *Hessle* (September and October).—Small but hardy, and very prolific, and the best for a standard.

5. *Jargonelle* (August and September).—A good early Pear, but will not keep. It succeeds well as a standard, and is very suitable for training up high buildings.

6. *Louise Bonne* (October and November).—Excellent; of medium size; succeeds in some places as a standard, but is worthy of bush or wall culture.

7. *Marie Louise* (November and December).—Succeeds best on a wall or fence, and requires a sheltered spot. In favourable places it does well as a bush or half-standard.

8. *Pitmaston Duchess* (October and November).—The largest of all and a very strong grower. Succeeds best as a bush, or on fence or wall.

9. *Williams's Bon Chrétien* (September).—Very widely known; large and well-flavoured. Succeeds as a standard or bush, and grows to a large size on wall or fence. Will not keep long.

Note.—As a rule, Pears are not a very profitable class of fruit for cottagers and small farmers to grow.

All Pears require great judgment in gathering; for example, Nos. 1, 5, and 9 should be gathered as soon as ever they will part easily from the tree, while Nos. 2, 3, and 7, should be allowed to hang as long as possible. Pears require great care in handling and packing, so as not to allow them to sustain the slightest bruise or injury, or otherwise they will rot.

PEARS FOR COOKING.

1. *Beurré Clairgeau* (October to December).—A long, handsome Pear, and good bearer; sometimes used as a dessert Pear.

2. *Catillac* (December to April).—Very large, round, solid fruit; the best stewing Pear; hardy and prolific. Should be allowed to hang on the tree late. Best as a bush, but succeeds as a standard.

3. *Uvedale's St. Germain* (January to April).—Very large; best on a wall.

4. *Verulam* (December to March).—A large and very hardy Pear; succeeds as a standard, the tree growing to a great size.

Note.—Stewing Pears may often be grown with more profit by cottagers and small farmers than dessert Pears, as they generally bear well and always keep and travel better, being less sensitive to injury; care, however, in picking and packing will be amply repaid by the increased value of the fruit.

PLUMS FOR EATING.

1. *Belgian Purple* (August and September).—Dark red ; a great bearer ; also cooks well.

2. *Coe's Golden Drop* (September and October).—Yellow ; the finest of late dessert Plums ; hardy and prolific, but should have a wall.

3. *Denniston's Superb* (late August).—Yellow-green ; of Greengage flavour ; a constant bearer.

4. *Jefferson's* (September).—Yellow-green ; a large and magnificent dessert Plum ; the best "all-round" table kind.

5. *Kirke's* (September).—Purple ; hardy, large, and valuable.

6. *Rivers' Early Transparent* (early September).—Green ; the finest early dessert Plum ; best on a bush or on wall or fence.

Note.—All dessert Plums are best grown on wall or fence.

PLUMS FOR COOKING.

1. *Denbigh* (September).—Dark red ; large ; a strong grower, and prolific.

2. *Gisborne's* (early September).—Yellow ; medium-sized ; a great bearer, and very hardy.

3. *Pond's Seedling* (September and October).—Red ; very large, vigorous, and prolific ; valuable market Plum after "Victoria" is over.

4. *Rivers' Early Prolific* (early August).—Purple ; the most valuable early Plum ; of superb flavour when cooked ; makes a fertile bush or small tree.

5. *Rivers' Czar* (mid-August).—Dark red ; a good bearer ; of strong upright growth.

6. *Victoria* (September).—Pink ; an enormous bearer ; the best for general purposes.

DAMSONS.

1. *Bradley's King* (mid-season).—Medium size ; excellent flavour and good bearer.

2. *Farleigh Prolific* (early).—Small ; an enormous bearer ; the best for exposed situations.

3. *Prune Damson* (late).—Large ; of Plum shape ; of spreading growth, and stouter than other Damsons. It is sometimes called the "Cheshire" and the "Shropshire" Damson.

CHERRIES FOR EATING.

A. FRUIT DARK-COLOURED : 1. *Black Eagle* (late).—Hardy and prolific ; an excellent late variety.

2. *Black Tartarian* (mid-season).—Large and fine-flavoured ; prolific ; one of the best.

3. *Mayduke* (early).—Hardy ; a free bearer ; good quality ; a popular variety.

B. FRUIT LIGHT-COLOURED : 1. *Bigarreau Napoleon* (late).—Very large and handsome ; rich flavour ; a free bearer.

2. *Elton* (mid-season).—Hardy and free bearing ; a first-rate Cherry.

3. *Frogmore Early* (early).—Hardy and very prolific ; a very fine early variety.

CHERRIES FOR COOKING.

1. *Kentish* (mid-season).—Bright red ; very juicy ; of fine flavour.

2. *Morello* (latest).—Dark red ; large and very juicy ; a fairly good dessert Cherry when thoroughly ripe ; usually grown on a north wall, where it hangs fresh and good till November or frost comes. Bears well in some places as a bush or a standard.

RASPBERRIES.

1. *Fastolf* (red).—Very hardy and prolific.

2. *Superlative* (red).—Large ; prolific ; extra fine.

3. *White Antwerp*.—Hardy and prolific white variety.

CURRANTS.

1. *Black Naples*.

2. *Raby Castle* (late red).

3. *Red Dutch* (early red).

4. *White Dutch*.

GOOSEBERRIES.

1. *Crown Bob* (red).

2. *Early Sulphur* (yellow).

3. *Gascoigne* (green).

4. *Hebburn Prolific* (dull green).

5. *Hedgehog* (white).

6. *Industry* (red).

7. *Ironmonger* (red).

8. *Keen's Seedling* (red).

9. *Leveller* (yellow).

10. *Red Champagne*.

11. *Warrington* (red).

12. *Whitesmith* (white).

Note.—The best to gather green are Nos. 1, 4, 6, 9, and 12 ; and for that purpose No. 12 is the earliest and No. 4 the latest. The finest flavoured

are Nos. 2, 3, 5, and 10. All the varieties named are good for dessert; Nos. 2 and 3 are the earliest, and Nos. 4 and 11 keep latest. Nos. 7 and 11 are the best for preserving ripe. Other prolific and useful varieties are Broom Girl, Lancashire Lad, Langley Green, Leader, Rifleman, and Snow-drop. Rumbullion is a great bearer; fruit small; valuable for bottling green.

STRAWBERRIES.

1. *Elton* (very late).
2. *James Veitch* (mid-season).
3. *Noble* (very early).
4. *Vicomtesse Héricart de Thury* (early).

Note.—No. 1, finest late variety, does best on cool soils. No. 2, very large, good quality, and bears abundantly on warm soils. No. 3, large and prolific, useful for its earliness. No. 4, hardy and very prolific, the best “all-round” Strawberry. Other good varieties are Aberdeen, Favourite, Moffat’s Duke of Edinburgh, Myatt’s Eliza, and President.

NOTE ON PLANTING.

The best time for planting all fruits is October and November, except for Strawberries, which should be planted in August or early in September. Just digging a hole, cramming the roots in, shovelling the soil over, stamping it down, and leaving it, is *the wrong way to plant*, and can only result in failure.

The *right way* is:—

i. Break up all the earth to a depth of eighteen inches, either in a square or circle of at least three feet across, but without bringing the bottom spit to the top.

ii. If the roots are in any way jagged or torn, cut the injured part cleanly off with a sharp knife, and shorten back all straight downward roots.

iii. Place the tree in the hole at such a depth that when the planting is finished it will be at the same depth as it was in the nursery, which will be seen by the soil mark on the stem. The depth should be such that the highest up roots will be about three inches below the surface when finished.

iv. The roots will generally be found to be growing from various parts of the stem. Spread out the lowest roots carefully on the soil and scatter a little fine earth over them; then spread out the roots next above these, adding more soil; then the next above, and so on, giving a little shake now and then to let the soil run in between the fine roots.

v. When all the roots are spread out and covered, give

the tree a good vigorous shake, add a little more soil, and then tread it in firm (not hard) and fill up the hole slightly above the surrounding soil, as it will sink one or two inches.

vi. Put a strong stake to the tree, and be sure that the way the two are fastened together is such as to make it impossible for the stem of the tree to chafe itself against the stake when the wind blows.

vii. Protect the trees from rabbits, cattle, and sheep.

It is impossible to exaggerate the importance of all the above details of planting.

If the natural soil is very poor, a little better garden soil may be brought for (iv) shaking in amongst the roots just to give the tree a good start, but no dung whatever should be used under the ground, though a thin layer over the surface when the planting is done will be helpful.

It is very important not to plant too deep (iii), especially in wet or heavy land. In very wet land it is best to plant the tree almost on the surface, and to mound the earth up to and over the roots.

It is very important to spread out *all* the roots, down to the smallest fibres (iv), and none should be allowed to take a straight downward direction, but every one duly spread out, slanting very slightly downwards from the point at which they grow out of the stem.

It is very important that the soil should not be left loose about the stem and roots (v), but firm treading does not mean hard ramming.

It is very important to fill up the hole two or three inches above the level (v), and not leave a hollow for stagnant water to fill.

It is very important to stake the tree (vi) firmly, so that the roots are not strained by the wind; but better not stake at all than allow the stake to chafe through the bark.

It is better to lay the tree in, just lightly covering the roots up with soil till a fine day comes, than to plant in wet, sticky weather.

No turf should be laid over the roots of newly planted trees; but keep the surface clean from weeds; and at intervals for the first two years lightly stir it two or three inches deep to let in sun and air.

Strawberries.—In planting, the collar or neck must be only just below the ground, and the roots be well spread out on all sides.

Raspberries.—When planting, spread out the roots and shorten back the canes to four or five eyes, in fact to a height of six inches. No fruit must be expected the first season, but fine fruiting canes for the next year will be produced.

NOTE ON PRUNING.

Apples, Pears, Plums, Damsons, and Cherries.—Cottagers will do well to ask some neighbouring gardener to prune their trees the first and second years if they require it. After the first year's growth has been made, standards will only need the removal of shoots that cross one another, and about nine inches cut off the points of strong shoots. Bush trees should have the side shoots of the branches well shortened back to three or four inches, and the leading shoots to eight or ten inches.

Strawberries.—When not wanted for fresh planting, the "runners" should be cut off as they appear, so as to throw all the strength into the plant. Do not cut the leaves off. Fresh beds should be made every third or fourth year.

Raspberries.—Thin out the young growths in early summer by *pulling up* the superfluous ones, and cut out the old canes altogether as soon as they have done fruiting. Manure should be laid over the roots, but the ground should never be dug near the canes.

Currants.—Red and White Currants should have the side shoots of the summer's growth shortened back to a couple of eyes, and the main leading shoots to five or six eyes, more or less, according as it is wished to let the bush increase in size or not. The centre of the bushes should be kept quite free from growths. Black Currants should be pruned on the exactly opposite plan, cutting out the old wood, and leaving the young growths their full length, only removing shoots in the centre to let in the sun and air. Red and White Currants bear chiefly on spurs on the old wood; Black Currants on the new (*i.e.*, last year's) growth.

NOTE ON MANURING.

It is a mistake to give young trees heavy dressings of manure, as the ordinary soil of gardens is rich enough. For the first few

years aim at laying the foundation of a good tree; keep the boughs rather thin, *i.e.*, well apart, not crowded, but fully exposed to sun and air, so as to ripen the wood, and thus form a sturdy basis for future good crops. Some kinds will bear the second year, and may then be assisted by manure laid on the surface after the fruit is well set, or by waterings of liquid manure, or soapy water, &c., in summer; but fruit trees, young or old, if they are growing and healthy, should only have manure applied when they are bearing a crop, so as to enable them to bring this year's fruit to perfection, and at the same time form fresh blossom buds for next year.

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Local Horticultural Societies may become Affiliated on the following conditions:

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1. Two copies of the *R.H.S. Journal* for circulation amongst the Local Society's Members.
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- Alvaston and Boulton Floral and Horticultural Society.
 Bath Floral Fête and Band Committee, 2 Northumberland Buildings, Bath.
 Bolton and District Horticultural Association.
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 Bradford Gardeners' Mutual Improvement Society.
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Dittons Horticultural and Industrial Society.
Dundee Horticultural Association.
Eastbourne Horticultural Society.
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Gravesend Horticultural Society.
Harrow Weald and Wealdstone Amateur and Cottage Garden Horticultural Society.
Haywards Heath Horticultural Society.
Hessle and Howdenshire Horticultural and Cottage Garden Society.
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Minster Horticultural Society.
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Nottinghamshire Horticultural and Botanical Society.
Petersfield Horticultural Show.
Reading and District Gardeners' Mutual Improvement Association.
Royal Jersey Agricultural and Horticultural Society.
St. Anne's Floral and Horticultural Society, Nottingham.
St. John's (Sevenoaks) Gardeners', Amateurs', and Cottagers' Mutual Improvement Society.
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Weston Horticultural Society.
Widcombe Institute.
Wolverhampton Horticultural Show and Floral Fête.
Woodford Horticultural Society.

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WINTER VEGETABLES.

By Mr. W. IGGULDEN, F.R.H.S.

[Read Jan. 12, 1892.]

WHEN we remember how scarce vegetables were during the winters of 1890 and '91, it seems almost incredible that there are as many as twenty-eight distinct kinds available or that may be had during most winters, and this without mentioning small saladings. Of this number about one dozen are what are classed as roots, and not more than nine can be considered as beyond the reach of the owners of most gardens or the means of moderately well-to-do householders. In spite, however, of this wealth of kinds of vegetables that may be profitably grown for winter consumption, times of great scarcity may and do prevail occasionally, and that through no fault of the cultivators. Our climate is, as a rule, far too moist to properly prepare the more tender vegetables (notably those comprised in the Brassica family) to withstand the rigours of exceptionally severe winters, and it is the loss of these that is most severely felt. The wealthier classes are perhaps the least affected by a scarcity of the more common green vegetables, their gardens or storehouses being better stocked with a variety of other vegetables which ordinarily clever cooks know how to turn to good account. Much, very much, depends in all cases upon the cooks, these in far too many instances being rightly included among the natural enemies of the gardener, who, when he finds that a considerable portion of the vegetables he sends to

the kitchen are thrown on one side, and ultimately pitched into the pig-tub, cannot help being disheartened, especially when he happens to have had quite a different experience with cooks worthy of the name. I hold that employers do not inquire sufficiently into the capabilities of cooks, or, at any rate, they attach far too much importance to their skill in concocting a variety of messes, and not nearly enough to their ability to serve vegetables to the best advantage. Judging from what I have seen of French cooks, they are far superior to their British rivals in the matter of cooking vegetables, and the same rule holds good when we compare the average British housewife with her French contemporary. As a nation we do not half appreciate the value of a good supply of vegetables, and it is only when there is a great scarcity of a few popular kinds that the merits of others less well known are tested or realised. A change of diet is considered indispensable, and rightly so, by doctors generally, and this change ought to comprise a far greater variety of vegetables than is usually the case.

It is scarcely possible, within the limits of a single paper, to comment at length upon the various winter vegetables that I shall mention; cultural details are also out of the question, but there are a few points that deserve emphasising. The commoner kinds, or those principally relied upon by the owners of (or those in charge of) comparatively small gardens, and also for supplying the markets, consist of Brussels Sprouts, Borecole, Broccoli, Savoy, Cabbage, Celery, and Leeks, and such roots as Potatoes, Onions, Carrots, Turnips, and perhaps Salsafy and Scorzonera. Of these the first six are liable to fail badly during a severe winter, and it is then that the owner of a good garden derives full benefit from his liberality in the matter of providing forcing-houses, pits, frames, boards, mats, and last but not least, a good well-heated Mushroom-house. Without some or all of these aids it is scarcely possible for the gardener to meet the requirements of many employers; but with them he can, if so minded, work wonders. Not only would he be enabled to protect and save many vegetables that would otherwise be lost, but he would also be in a position to force or forward a variety of other choicer kinds. My advice to employers, therefore, is to first give their gardeners all reasonable facilities in the way suggested, and then, but not till then, insist on being well supplied with winter vegetables.

It is scarcely desirable to attempt protecting Brussels Sprouts as it is not often this serviceable variety fails. By all means grow a comparatively large breadth of them, selecting those kinds which form small close "buttons," rather than any of the Aigburth type, raising the plants under glass early in the spring and planting them out among dwarf-topped Potatos in rows three feet apart, soon after the latter are moulded up. Thus treated Brussels Sprouts usually prove exceptionally productive, and are quite indispensable.

Borecoles, again, are of great value, and with but few exceptions are very hardy. The Scotch or green curled forms are among the best that can be grown, Read's Improved Hearting being my favourite, forming a good-sized blanched heart, which, when cooked, is very mild in flavour and most tender. This variety suffered badly last winter, and it would have paid well to have bedded a portion of the crop, either in frames or together in the open where they could have been protected with mats, litter, or bracken. The Buda (or Asparagus) and Cottager's Kales are among the hardiest that can be grown, but must be classed as spring rather than as winter vegetables.

Broccoli are usually very scarce during the winter months, though they need not be so if there are any conveniences for protecting the varieties that "heart" early. As it happens, the best of these—viz. Veitch's Self-protecting Autumn—is also one of the most tender varieties in cultivation, but all the same it has rightly supplanted the old Walcheren, White and Purple Cape, and Backhouse's Winter—the three former of which are also anything but hardy. Plants of Veitch's Autumn Protecting, raised under glass in the spring and got out early on good ground, grow to a great size and form hearts during the autumn; but in order to have a good supply more seed should be sown in April, or not later than the first week in May, in the open, the plants being put out on good ground, not less than two feet apart each way, before they become leggy. This should result in the growth of a large batch (two or three hundred plants are none too many for large establishments), and if the bulk of these are lifted with a moderately good ball of soil, and, after being cleared of the very oldest leaves, replanted somewhat thickly in deep frames, pits, or cool vineries, the roots being firmly surrounded by rich soil and kept moist, protection from frosts being afforded, a long

succession of medium-sized hearts will be forthcoming. Much also might be done by lifting and replanting on a border where the plants could be hooped over and protected with mats. By these means the supply might easily last till the end of January, and a succession could be had with the aid of Snow's Winter, which, though hardier than Veitch's Autumn, yet requires to be protected from severe frosts. Where many err is in raising the plants of this variety too early, a rough and comparatively worthless lot eventually resulting. The first week in May is the time to sow the seed, and liberal after-treatment will do the rest. Transplant to pits and rough frames according as there is room for them, and a useful lot of hearts will be obtained at a time when Broccoli as a rule are very scarce.

Savoy or Savoy Cabbage are more appreciated on many dining-tables than are Brussels Sprouts, and if not grown too large they are undoubtedly very tender and mildly flavoured when cooked. They ought, therefore, to be grown extensively, especially seeing that they are tolerably hardy. At the same time it frequently pays well to transplant and protect a few score or hundreds of fully grown plants, especially if the hearts are much blanched.

Any varieties of the ordinary Cabbage may be had in perfection during most winters, but the Rosette and other Coleworts are perhaps the most serviceable. In each and every case the seed ought to be sown during the first fortnight in June, and the plants got out early, thick planting being resorted to. Only exceptionally severe frosts injure or destroy them.

Chou de Burghley, a hybrid or sport with the growth of a Broccoli and the heart of a Cabbage, raised early and grown strongly, becomes so very coarse as to be of little value; but if the seed is sown late in April or early in May, and the plants treated more as Cabbages than Broccoli, they will not grow too large, and a serviceable and fairly hardy lot of hearts may be obtained. They will not stand an arctic winter, but not unfrequently a capital supply of hearts are available during January and February, so that Chou de Burghley must be considered a desirable winter vegetable.

As before hinted, many amateur and professional gardeners rest contented with their endeavours to grow a few (or many) of the foregoing, which I term "green vegetables" to distinguish

them from those cultivated for either their roots or leaf-stalks, far too many overlooking the value of a good supply of Spinach and substitutes for the same. Yet Spinach is extremely hardy, very wholesome—it possesses a medicinal property in fact—and is decidedly a high-class vegetable; that is to say, is always acceptable on the tables of the wealthier classes. I readily concede that failures with it are common, and in many instances difficult to avoid. But in very many cases, if the ground was well pulverised and prepared several weeks in advance of seed-sowing time, there would be far less likelihood of failures occurring. This vegetable requires and must have a well-sweetened, finely divided, and not very poor root-run; frequently dressing the surface with soot and stirring it into the soil both before sowing and after the plants are up will do much towards getting rid of all insect pests. I have lost more plants this season by destructive winds than from any other cause, and from this it would appear that a sheltered spot ought if possible to be selected for this important crop. Sowing too late is another frequent cause of failure. Sow a good breadth of ground not later than the first week in August, making one or two more sowings at fortnightly intervals, thereby being prepared for any emergencies. The Victoria and Monstrous Viroflay are the finest varieties for any crop, the Round-seeded Summer being also quite as hardy as the Prickly-seeded Winter.

Where the true Spinach cannot be profitably grown, the Spinach-leaved Beet would perhaps be found a fairly good substitute for it, though not a little depends upon the goodwill of the cooks, for if these individuals decide that it cannot be got into a fit condition for the table, nothing the gardener can say or do will convince them they are wrong. Spinach Beet should be sown at the same time, and in other respects be treated similarly to ordinary Beet, but should have many of the older leaves removed during the summer, and the roots, which are very hardy, be left in the open ground, the fully grown but not very old leaves being gathered as required for use.

I have met with cooks who refused to use the Spinach Beet as a substitute for the genuine article, but never experienced any difficulty in persuading them to see what could be done with Endive. I hold Endive to be a really excellent winter vegetable, and those who have plenty of rough frames, and either lights or

mats or other protective material in abundance, ought certainly to store a considerable quantity of well-grown plants of the Improved Broad-leaved Batavian for winter use, not merely for salads, but also for cooking as a vegetable.

Leeks, again, are not so generally appreciated a vegetable as could be desired. A few (or many) are grown in most gardens, but they are used principally for flavouring soups, only a comparatively few realising that well-blanchd and properly cooked Leeks are by no means a despicable vegetable. One great point in their favour is their hardiness, and probably, if we had more extra-severe winters, Leeks would become far more popular than they now are.

Both Cardoons and Celery are turned to good account in some kitchens, but unless they are properly cooked few would care to eat either the one or the other. The first-named are not so much grown as of old, few gardeners caring to take so much trouble as their culture entails, for no good purpose. If modern cooks either knew how or cared to prepare them for the table, Cardoons would without doubt be forthcoming.

When we come to consider the root crops proper—that is to say, those vegetables which are cultivated solely for their edible roots—my ire against the inferior cooks becomes even more pronounced. How many employers ever see a decent Potato on their table? Not one in twenty. Cooks either do not know how, or do not care to take the trouble, to serve them properly, and instead of their being bright in colour, dry and mealy, the Potatoes are usually nearly black, sodden, and uneatable. Occasionally the gardener may be to blame in the matter, his selection of varieties either being too extensive and bewildering to the cook, or else unsuited to the soil and positions in which they are grown. As far as the majority of town dwellers are concerned they are very much at the mercy of market growers, whose sole aim is to grow as heavy a crop as possible regardless of quality.

Take Parsnips again. Every gardener grows them, but in how many cases do the cooks send them to the table in a state at to eat? Doubtless they are frequently grown too large, but if each and all were boiled nearer one and a half hours instead of about twenty minutes, they would become tender right through, find a really excellent dish be available.

Nor are Carrots half so much used as a vegetable as they might well be, though they would become far more popular if boiled long enough to soften them to nearly the consistency of marrow. Those with plenty of frames can easily have sweet and tender young Carrots of the Horn varieties nearly or quite all the year round, and certainly throughout the winter months, and even without these aids a serviceable lot of young Carrots may be had by sowing seed on warm borders early in July.

Onions are usually available in fairly large quantities, and, well cooked and served, form a tempting dish, to say nothing of their good qualities when fried and served with a beefsteak.

Turnips are also popular enough, and would be even more so if the hardy, mildly flavoured, and very tender Chirk Castle Black Stone was more generally grown. Although this variety has a black skin, the flesh cooks quite white.

Jerusalem Artichokes are known to everybody, but, although grown in most gardens, there are frequently more roots spoilt than used. In this instance I blame the growers rather than the cooks. According to my experience, these Artichokes are very often treated too much like Horseradish than is good for either the quality or quantity of the crop. In other words, what roots are required for use are dug and the rest left to grow again, and thinning out perhaps being all the trouble taken with them. That is not the way to grow good wholesome roots; but, on the contrary, these can best be had by changing the site and otherwise treating them much as Potatoes are cultivated. The new white-skinned variety should be grown everywhere.

Stachys tuberifera, or Chinese Artichokes, form an agreeable variety, and are easily cultivated; but I find the cook has to be looked after rather closely, or otherwise not many of those "bothering" little tubers find their way to the dining-table. In all probability this species will never become very popular.

Salsafy and Scorzonera are both fairly popular, and if the cook possesses the skill, or is so disposed, they can be converted into tempting dishes. If they fail to do well, or the majority of the plants run to seed prematurely, this is usually due to sowing the seed too early, the first week in May answering best.

Celeriac, or Turnip-rooted Celery, has fewer admirers, though it is by no means to be despised as a vegetable. I find the Apple-rooted and Large Early Paris very superior to the ordinary variety.

Having dwelt at considerable length upon the commoner kinds of vegetables, or those within reach of most people in easy circumstances, I shall have to allude more briefly than I had intended to the choicer though in many cases quite indispensable species. In the latter category I would include Asparagus, Sea-kale, Kidney Beans, Cucumbers, Mushrooms, and Tomatos.

Asparagus safely may be said to be the choicest of all choice vegetables, and those who have the space to prepare a few hundred roots for forcing ought certainly to omit no opportunity of doing so. The usual practice is to break up an old bed and to plant a new one annually, and in this manner sufficient roots or crowns are obtained for forcing without greatly interfering with the ordinary supplies of Asparagus. But the question arises, Is it always good policy to break up a bed, originally prepared, probably, at considerable expense and trouble, just when the Asparagus is in its prime? Would it not be better in many cases to prepare the requisite number of roots specially for forcing? In this case there would be no need to make any elaborate preparations for either the seed or seedlings; in fact Asparagus will usually succeed well on ground prepared as if for Potatoes, and is undoubtedly one of the best crops that could be grown in newly planted cultivated orchards. They would do the least harm to the roots of the fruit-trees of almost any vegetables that could be named, and I have seen some grand Asparagus cut from strong clumps in orchards. Even if the Asparagus roots must be prepared in the kitchen garden, this would not necessarily take up very much more space than the older system does, and would answer nearly or quite as well—that is if the plants were allowed sufficient time. I have had comparatively strong roots in one year by raising the seedlings in heat, pricking them out in boxes, and finally planting them out very much as bedding plants are treated, and after another clear season's growth they gave fine shoots when forced, though, it is almost needless to add, the quantity did not equal what extra strong old clumps will yield. Asparagus for forcing may well be sown where the plants are to remain for two or three seasons, or one-year-old stuff may be transplanted, giving them good open ground and sufficient room to develop, and if this is done every spring there is soon no need to interfere with established beds. Nothing forces more readily than Asparagus, but it is a great mistake to subject the roots to

either a strong or dry heat; give the roots the benefit of a gentle hotbed, packing the roots closely on this and covering with not less than three inches of fine rich soil. The top heat not exceeding 55° , strong shoots will appear in less than three weeks, and a fairly long succession may be had from a single batch, the supply being kept up by means of successional batches introduced into heat about every eighteen days. Asparagus lifted before the frost usually experienced towards the end of December throw up shoots very quickly, but in all probability the next batch will be longer in moving owing to the check given to the abnormal activity of the roots.

Seakale is far more commonly forced than Asparagus, and in this case it has become the fashion to prepare the requisite number of roots for lifting and forcing—this being found much the simplest and surest way of getting early, well-blanchéd produce. But much finer and, it may be, more succulent heads can be had by forcing strong old clumps where they are grown; but this means a considerable amount of labour and much watchful care—more especially to prevent injurious over-heating of the material used for forcing. Short cuttings of strong side-roots, saved when the crowns are being lifted for forcing, and duly stored in sand or fine soil, and planted out after leaf-buds and a few root-fibres have formed, will in the course of one summer develop into fine stuff fit for lifting and forcing the following autumn or winter. It is scarcely possible to prepare too many of these for forcing, their great value having never been more apparent than was the case this last winter. Fully one acre is devoted to the preparation of Seakale in gardens connected with some few large establishments that could be named, and not a plant too many is grown. The plan of raising Seakale from seed compares most unfavourably with that of putting in cuttings, while the variety known as “Lily White” is infinitely to be preferred to the old purple-tipped form. Unfortunately the former is the least hardy of the two, and the crowns left in the open ground till wanted ought to be either moulded up or protected with litter. Seakale forces readily in a Mushroom-house, or in any other darkened, well-heated place the roots being buried in rich soil and kept uniformly moist. If boxes or deep pots containing the roots are set on a flue or on hot-water pipes, the first growths may be cut in less than

three weeks—our first this season being grown in eighteen days; but away from a strong heat fully ten days longer ought to be allowed.

Blanched Swedish Turnip-tops are a fairly good substitute for Seakale, and to get these all that is necessary is to introduce a few strong roots at a time into a Mushroom-house or warm cellar—in the former case plunging them in moist rich soil.

Rhubarb, though classed as a vegetable—which in reality it is, being a leaf-stalk—is usually used as a fruit. Strong clumps of the Early Red, Early Linnæus, or other early varieties force readily in the open ground when covered with tubs and heating material; or they may be lifted and forced in Mushroom-houses or other heated places, and also forwarded considerably in warm cellars with but little trouble.

None but those who have command of extra well-heated and light forcing-houses can succeed in producing Kidney Beans for use during the coldest part of the year, though if they can be sent to the dining-table they are certain to be greatly appreciated, being very preferable to any that may have been preserved in salt. The best winter crops I have ever grown were of the old Osborn's Forcing, there being five or six plants in each 8-inch pot, three batches of about fifty pots being grown in close succession in a Pine stove.

Cucumbers for cooking purposes are not often grown, but there are establishments where they are wanted every winter—this more for the sake of having a variety rather than for any great liking for the dish. In order to have a good crop of large fat Cucumbers (for they like them to be of a good thickness for cooking) a batch of strong, healthy plants should be in their fruiting quarters not later than the first week in October, it being advisable in some instances to raise a second batch of plants a month later. I prefer growing them in pots and placing them where they can have the benefit of a brisk bottom heat, keeping the roots active and the plants in good bearing order by means of frequent top-dressings of good turf and plenty of liquid manure. The plants ought to be trained thinly over the roof trellis in a house the temperature of which seldom falls below 65°, and is kept during the daytime near 70°. Not till they have formed a good length of strong haulm ought any fruit to be allowed to form, and anything like

a heavy crop should not be left on at one time, at least if there is any necessity for keeping the plants in a healthy productive state.

Tomatos are more within the reach of the many, but to be sure of a good winter supply, plants ought to be in their fruiting quarters not later than the first week in August, the aim being to get a heavy crop set before the short, dull days of late autumn arrive. A few may be fit for use before they are needed, but the bulk of the fruit will ripen in succession throughout the winter, and nothing that can be sent to the kitchen will better please the cook. The plants succeed best thinly trained over the roof of a freely ventilated, well-heated house, stewing them being a most unwise proceeding. It is immaterial whether they are trained on the extension system or each plant be kept confined to a single stem, providing always that crowding is avoided. If disease is troublesome do not stop quite so closely, as a few side-shoots, or even only a few young leaves, will serve to take the place of the diseased older ones, and the fruit be kept swelling accordingly. Dwarf Orangefield, Old Red, and Conference are among the best varieties for winter culture; but most other popular sorts will succeed well if a comparatively early start is made.

On the value of a good and constant supply of Mushrooms there is but little need to enlarge. In very mild winters they can be had in quantity and close succession from ridge-shaped open-air beds, and also from flat beds in snug sheds, stables and outhouses; but these supplies are most uncertain whenever a spell of extra cold weather sets in. A gentle heat, or a temperature of about 55° , is all that is necessary or advisable, a stronger heat unduly hastening and weakening the crops. Where so many err is in constantly syringing the beds, the surface soon becoming saturated, which means destruction to Mushrooms. Better keep them a little on the dry side, giving only gentle waterings occasionally.

PLANTS FOR HOUSE DECORATION.

By Mr. JOHN WILLS, F.R.H.S.

[Read March 8, 1892.]

No one who has visited the pleasure gardens of the rich or noticed the humble garden-plots of our country cottagers, or even glanced at the window-boxes and pot-plants in the artisans' dwellings in many of our smoke-begrimed towns, can for a moment doubt that the love of flowers generally, and the taste displayed in their arrangement, have increased tenfold amongst us during the last twenty years. And that this increased love of flowers has immensely benefited horticulture and those engaged in its most elevating pursuit, is also a well-known fact. And as the amount of money spent on any particular luxury or amusement is to some extent a measure of its popularity and progress, it will perhaps be interesting first to trace the rapid strides which have been made of late years in the floral decoration of houses and public buildings, as indicated by the sums of money spent upon it, and then to consider some of the plants most suited to the purpose.

Twenty-five years ago £25 or £50 would have been considered—was considered—an extravagant and altogether unheard-of sum for any nobleman or gentleman, however wealthy, to spend upon the decoration of his house for a dinner party or a ball, or any other entertainment. But in 1871 the rage for elaborate floral decorations came in, if one may say so, with a rush. It was initiated by the late Sir Edward Scott, whose love of flowers and whose liberality were both unbounded. He gave his house up into his florist's hands for three full days, with *carte blanche* orders, regardless of expense, the only stipulation being that the handsomest decorations possible should be produced, and the result was both so novel and so beautiful that almost everyone who gave great entertainments during that London season of 1871 followed in the track which he had pointed out.

During the following years many and much larger decorations took place, amongst which may be instanced what at the time was called the "hanging gardens of Babylon," on the occasion of a ball given by the Marquis of Bristol, when six tons

of cut Ivy alone was used, to give a castellated effect to the bare walls of an improvised ball-room. A few days afterwards one gentleman gave a magnificent entertainment, the flowers for which cost over £500. Various other similarly decorated entertainments followed, the result being that more than £3,000 was paid to one single firm for floral decorations only, in less than one month, and Messrs. Veitch, Turner, Paul, Bull, Lane, and many other great plant-growers were very largely drawn upon, nothing being considered too expensive or too rare. Magnificent Orchids, Roses by the ten thousand in a single day, as well as innumerable Ferns and other decorative plants were used.

On July 21, 1873, the first large public entertainment was given in the conservatory of the Royal Horticultural Gardens, in connection with a ball given in honour of H.R.H. the Prince of Wales. Here for the first time ice was largely used for cooling the heated atmosphere of the ball-room, and after this initiative by the Society, as much as forty tons of ice was used on different occasions. At one gentleman's mansion in Belgrave Square the floral decorations more than once cost over £1,500. Many other similar decorations followed in which Orchids and ice were largely used. These few instances are mentioned out of many, in order to show what has caused the enormous increase of late years in the cultivation of plants for house and window decoration.

In a letter to me, Mr. Assbee, of Covent Garden Market office, says that he roughly estimates the number of vanloads of English-grown plants sent into Covent Garden Market last year (1891) at 20,000, and in addition to this, immense quantities of boxes of flowers were brought into the market by hand, and much larger quantities still were sold by auction in the Floral Hall from all parts of the Continent, the Channel Islands, &c. Mr. Assbee further tells me that the number of growers who attended and sold plants in Covent Garden Market twenty years ago was only about thirty persons, whilst at the present time they number over three hundred.

As an instance of the immense quantities of plants, &c., supplied by the various growers, I may just mention that the firm with which I am connected has during the past year bought from the market at Covent Garden, and from other sources, over a quarter of a million of plants, consisting of Ferns,

Palms, and all kinds of flowering plants. And when we consider the vast quantity of plants and flowers sent to London and the different provincial markets, it will at once be seen how *enormously* the cultivation of plants and cut flowers has increased, and to what an extent it has benefited horticulture commercially, providing additional employment for large numbers of men, women, and children. You cannot even go into any back street in London without seeing eight out of every twelve window-ledges covered with plants; and this not only shows that a great elevating influence is being developed amongst the working classes, but that it is a benefit to vast numbers of working people who are employed in the cultivation of plants.

It will be within the recollection of most horticulturists, and of those who love flowers and can appreciate their effect when judiciously arranged, what magnificent groups of plants were arranged for effect some few years ago by the leading London nurserymen and florists at the Royal Horticultural Society's Gardens, and at Regent's Park, Manchester, and various other places; and how much it did towards infusing and developing a taste for a more natural style in the arrangement and adornment of conservatories, dwelling-houses, and garden decoration in general. Nature is the greatest schoolmaster, and the only guide the floral artist should take lessons from. He should "consider the lilies how they grow," and watch our meadows and the banks of our meandering streams clothed with their simple flowers, and see how all is arranged for good effect, and watch how the juxtaposition of colour is displayed. Nature never arranges two things alike, only in cases of trees or shrubs, when seen in woodland scenery. This, therefore, is the great lesson to all who would aspire to arranging plants for effect, never to arrange any *match-pairs* of plants in their groups, but make them as dissimilar as possible. The wonderful display made by the Covent Garden growers on recent occasions at the Royal Horticultural Society's great spring shows at the Temple, is a sufficient proof of what the energetic and plodding industry of horticulturists can attain.

I will now give a list of a few of the many plants suitable for house and window-box decoration. For either purpose the following may be used, and can in all cases be depended on if kept properly watered and clean. Palms are to all intents and

purposes the most useful, by reason of their graceful habit and long-lasting qualities. Amongst these may be recommended *Corypha australis*, *Latania borbonica*, and *Cocos Weddelliana*. This last is decidedly the most graceful and best lasting Palm that can be used for house decoration. Up to a recent date it was generally thought that the plant required a much warmer temperature, and that it would only last a few days in an ordinary living-room. I have proved, however, that with ordinary care it will last for more than two years in even a cold and draughty position. I have had some plants in my house for nearly two years, which are looking at the present day as well as they did the first day they were brought in. They are also very pretty when grown in small thimble-pots, which can then be easily put into the smallest drawing-room vase. *Phoenix rupicola* is also a very graceful and useful Palm, but has not the long-enduring qualities of *Cocos Weddelliana*. *Kentia Belmoreana*, like *Cocos Weddelliana*, is one of the most useful for all purposes. Plants of this lovely Palm can be grown to a height of 12 to 15 inches in a 2½-inch pot, and will last in a drawing-room six months or more if kept well watered and clean. We have some specimens from 30 to 35 feet in height which are simply grand, and although they have been subjected to all sorts of hard treatment for many years they are very little the worse for it. Any of the following are also available for room or flower-box decoration, namely, *Areca Baueri* and *A. lutescens*, *Cocos flexuosa*, *Chamærops excelsa*, *Geonoma gracilis*, *Phoenix reclinata* and *P. tenuis*, *Rhapis flabelliformis*, and *Thrinax elegans*.

Amongst ornamental and coloured foliage plants the following may safely be relied upon as being very useful and satisfactory, and possessing long-lasting qualities: *Ananassa sativa*, *Asparagus plumosa* and *A. procumbens*. Plants of the latter are most graceful and useful by reason of their pretty feathery and procumbent habit, and their adaptability for decorating vases and mantel-pieces. When used with Orchids or other flowers they produce an exceedingly charming effect. *Bambusa nigra* and *B. falcata* are two most graceful and useful plants. Many handsome Crotons may be used with impunity for house and window-box decoration. The following Dracænas are also very pretty, and may be used to great advantage: *Dracæna australis*, *D. fragrans*

Lindeni, *D. Linita*, *D. Goldiana*, and many other beautiful varieties. *Nidularium fulgens* and other ornamental Bromeliads may be freely used, and will retain their beauty for a long time. *Pandanus Veitchii*, *Phormium tenax*, *Pourrettia mexicana* and *P. argentea*, Tillandsias, *Aspidistra lurida*, and its variegated form, are most useful and never-failing plants. Several of the Fittonias are also pretty. *Hydrangea hortensis variegata* is a beautiful plant when grown in small pots, being prettily variegated, and is very effective in any decoration. The never-dying Ophiopogon, any number of Ferns, and various other plants too numerous to mention, are available for all purposes.

I have seen most lovely window-boxes in London filled with the following plants: Kentias of sorts, Aspidistras, *Dracæna Goldiana*, and other bright foliage varieties; Crotons in variety, Bamboos, *Nidularium fulgens*, Tillandsias, Fittonias, Panicums, *Pandanus Veitchii*, Tradescantias, Phoenix, Seaforthias, Hydrangeas, Ophiopogons, Ferns in variety, *Nertera depressa*, &c. These plants kept fresh and beautiful from June to the end of October, showing the advantage of using foliage plants in preference to flowering plants for window-box decoration. If flowers had been used the boxes would have certainly required to be refilled at least four times during the period, and would not at any time have looked so graceful or so pretty.

CULTIVATION OF THE MELON.

By Mr. C. Ross, F.R.H.S.

[Read March 22, 1892.]

THE Melon (*Cucumis Melo*) is a native of the south of Asia, where it still grows spontaneously. It was taken to America by Columbus, and was introduced into Great Britain about 1570, and it is now pretty generally grown in nearly all the tropical and temperate regions of the earth. Its cultivation, which has long been one of the most important duties of a gardener in this country, requires daily attention to small details in order to get the fruit to such a state of perfection as will give satisfaction

to the consumer and credit to the grower. And if in this paper I am unable to introduce anything new about the cultivation of Melons, I can at least explain the means I have myself used during upwards of forty years' practice, and which, though not without failures, have had a very fair amount of success.

There are a great many varieties of Melons in cultivation, and new ones are produced every year, some being held in high esteem for perhaps ten or a dozen years, when they are gradually displaced by others. One reason for this is, that the blossoms being so easily cross-fertilised, they require the very greatest care to keep them true; and even within my own recollection, those which were considered the most popular sorts, such as Beechwood and Egyptian Green-flesh, are now little known even by name.

The season for Melons extends from the end of April till the end of October; they may be had later, but the fruit will be very inferior in flavour to those ripened when the days were long and the sun powerful, and they are always better in a bright summer than in a dull one.

In preparing for cultivation, the first thing to be considered is the soil in which they are to be grown. The most suitable for the purpose is rich stiff loam, got if possible from an old pasture where sheep or deer have been grazed; it should be dug six months before it is wanted, and stacked up to be made friable by the action of the weather. Such a soil will not require any manure mixed with it (manure applied in a liquid state answers best for Melons); but if only very light loam can be had, a fourth part of clay cut very fine may be mixed with it. Plants raised from seeds a few years old will be found to be shorter-jointed and to fruit more freely than those raised from new ones. A very successful grower, under whom I was employed nearly half a century ago, liked to keep his Melon seeds from five to seven years before sowing them. In those days, and even much later, when Melons were mostly grown on beds of leaves and stable-manure, a great deal more labour was required than at the present time with properly constructed pits and houses, in which it is an easy matter to maintain a suitable temperature at all times. If fruit is wanted early, seed should be sown as soon as the new year comes in. Use 3-inch pots, one seed in each; and light loam with a little leaf-mould, well warmed and rather

moist, answers well for soil. The pots should be covered with a pane of glass, and plunged in a bed where they will have a steady bottom-heat of from 70° to 75°. They should be kept as near the glass as possible to prevent them being drawn up; and the great aim being to get sturdy plants to start with, the temperature of the pit should be, according to the weather, 65° to 70° at night, and 75° by day when it is dull, but when the sun is out it may be allowed to go up to 85° with a little ventilation, but avoid letting cold draughts in upon them, as it gives them a check from which they seldom really recover. Shift them into 5-inch pots before they get pot-bound, and stake them carefully.

It is a good plan to grow the earliest crop entirely in pots, as they ripen quicker so than when planted out, and two good fruits may be had from a 12-inch pot. When ready for another shift put them into the fruiting pots, making them about three parts full, and potting pretty firmly; and as the roots come to the surface keep adding more soil till within two inches of the top. Thus early in the year (March) they will not require so much moisture as the later crops when the sun is more powerful. Sometimes the stem will canker just above the surface of the soil; and as soon as there is the least appearance of this, a mound of charcoal dust should be put round the stem, and when giving water care should be taken to wet the stem as little as possible. When enough bloom shows for a crop, keep the atmosphere of the pit drier, with a circulation of warm air over the plants, and about mid-day, when the pollen is dry, carefully fertilise the female flowers. When the fruit is seen to be fairly started top-dress the soil with Thomson's manure, and water alternately with rain-water and liquid manure from the stable-yard. Never use cold water at any time, but let it always be 5° warmer than the soil in which the plants are growing; and when earthing the beds up, always warm the fresh soil before putting any of it on. All blooms, male and female, should now be taken off as fast as they appear, as they have a tendency to weaken the plant, and the greatest care should be taken at all times to preserve the foliage. Stop the fruit-bearing growths one joint above the fruit, and remove all superfluous laterals. When the fruit gets towards the ripening stage, give only clear rain-water, and no more should be given than is required to keep the leaves

fresh ; an overdose will cause the fruit to split, but the flavour will never be first-rate unless the foliage is kept thoroughly healthy. The fruit should be suspended in a bit of netting, or on a thin piece of board, which should tilt towards one side or have a hole in the middle to prevent water lodging under the fruit. The fruit will be ready to cut when it emits a pleasant smell and cracks round the stem, and Melons are generally found at their best two days after being cut, although some sorts will keep well for a week or more.

The mid-season crops that are planted out in beds, and have the advantage of long light and summer sun, will require a greater depth of soil to grow in than those which are grown earlier or later in the year. The ridges or mounds in which they are planted should be 16 inches deep, and the rest of the bed, when earthed over, about 4 inches less. They will also take much more water—not given in driblets, but in sufficient quantity to moisten the whole bed ; and if then top-dressed with old mushroom-bed manure, it will prevent evaporation and help to nourish the crop. In bright weather (*except* when the flowers are being fertilised, and again when the fruit is ripening) always syringe the foliage in the afternoon when shut up with a high temperature from sun-heat ; do not drive the water on so roughly as almost to make holes in the leaves, but endeavour to make the water fall like a gentle shower or heavy dew. If the plants are healthy when the fruit is cut, by being pruned back a little and encouraged with a moist warm atmosphere, they will often bear a second crop very little inferior to the first, but many prefer to have a set of strong plants in 10-inch pots ready to fix to the trellis as soon as the other lot are cleared out.

Melons are not subject to disease if kept growing vigorously, with their shoots trained over a trellis in a suitable house. Gumming and canker are brought on by pouring water on to the stem, especially if it be used cold, or by having manure in the soil in which the plants are growing. It is generally in cold and badly-ventilated pits that these diseases are found.

SOMETHING MORE OR LESS ABOUT DAFFODILS.

By the Rev. G. P. HAYDON, F.R.H.S.

[Read April 12, 1892.]

MOST English people, of whatever rank of life they may be, who have a few inches of idle space at their disposal, love to cultivate some kind of plant or flower. The cottage window, the town leads, the grave in the old churchyard, as well as the garden, all are made to contribute to the production of some kind of beauty. I well remember one hot May day, after a tramp along the hard high road, coming on a little bit of garden in the shade with a bunch of very fine *Narcissus poeticus recurvus*, looking as fresh as paint. I stopped and had a chat with the old one-legged cobbler who was the proprietor of the garden, and bought the flowers at 1*d.* each. I never had seen better—I don't think now I ever see any as good—but wish, as I grow them by the thousand, that others valued them at the same rate.

I have been persuaded to read a paper about the *genus*, and, as I am not a botanist, and do not know the meaning of half the technical words those gentlemen employ, I hope the learned part of my audience will treat my paper as a Lenten penance, and will not be severe upon my ignorance.

First, then, I would speak of the cultivation of *Narcissi*. People who see them in perfection in florists' windows, and in a somewhat less excellent state in the streets, do not always think where they come from, or whether it pays to grow them. They buy them at all prices from 2*d.* to 2*s.* a dozen, and then are astonished when they grow them at home to find that their price is increased tenfold. Now, I cannot make my paper suit all parties, as I must hurt the feelings of the bulb-sellers by some of my advice, and the feelings of the buyers by another part. I would begin by saying to those with small gardens, Don't plant any *Narcissi* unless you can leave them alone for three years; don't mix herbaceous with bedding-out plants; don't put spring-flowering bulbs amongst autumn-flowering herbaceous; plant your Daffodils as a rule among your spring-flowering shrubs, and the late-flowering varieties in any place where there are no

bedding-out plants, and which is in shade from eleven o'clock to four, but which has either the morning or the evening sun.

To those who have more ground at their disposal I would say, Remember that Narcissi come from all manner of altitudes and situations, and do try and give them some of the conditions under which they naturally grow. Nothing is more ridiculous than to see, what I have been doing for years, Narcissi from all parts growing on a flat piece of ground with water within three or four feet of the surface in the winter, and with no protection from sun or wind when they are in flower. The beautiful small varieties are best grown in rockeries made in imitation of nature, with a good solid bottom, plenty of drainage and plenty of soil, and not a contract abomination which is nothing but a rubbish heap and a breeding place for snails. On the west coast of England and Scotland, and south of the Thames, a well-made rockwork, with good soil composed of loam, leaf-mould, and sharp sand, covered with *Narcissus nanus*, *minor*, *mimimus*, *triandrus*, and *Bulbocodium* varieties, *rupicola*, *juncifolius*, *moschatus*, and *cyclamineus*, would be a thing of beauty. But, as far as my experience goes, on the east coast, in a colder climate, and wet in the autumn and winter, such an experiment is only a loss of money, labour, time, and temper. With the larger varieties, learn which like heavy soils and which light ones; and even more than this, learn which varieties resent being taken liberties with and those which do not so much mind rough treatment. Two years ago I was taking up my bulbs for planting in a new place to get the varieties for comparison more together, and it came on to rain for a fortnight. Instead of waiting till another year for a favourable opportunity I went on; the new roots had grown some inches, and four or five valuable varieties so resented this treatment that practically I have lost them. The period during which bulbs are at rest in a wet summer is very short, if indeed there is any such period at all.

I would now say a word to those who force Narcissi, that is, who grow them in pots for decorative purposes under protection. With the commoner sorts do not be at the trouble of saving the bulbs, but with the more valuable varieties keep them growing on under protection after they have flowered, and do not put them out of doors till the end of May or the beginning of June. Almost invariably they will rot if you do. Knowing very little what to

say on this subject, I wrote to a friend asking for suggestions, and he said that competition in flower-growing was so keen nowadays, that all practical knowledge gained by experience must be reserved to earn one's own living. My advice to the general public who do not want their flowers on roots is, buy more liberally, and if a few join together to buy wholesale in Covent Garden Market, they will help the growers to get a better price.

I pass on to the choice of sorts, and I would remind you here that you do not want to pick out the flowers you like best at a show, or to order them out of a catalogue with your Tulips and Hyacinths, and then grumble at your gardener if they are not everything you expected. Many of the old and cheapest varieties are among the most beautiful and useful; some of the new and very expensive varieties are quite hardy, and worth all they cost to an appreciative purchaser. But think of soil and situation and gardener before you purchase. Plant the cheaper sorts of the different classes to find out if the situation is suitable, and then acquire the rarer varieties of those which grow the best. If possible find a nurseryman with a soil similar to your own, and see the plants in flower there before you order them, and even then do not pass your judgment on what you see unless they have been grown for more than one year on that particular ground. Soil has much to do with the variation of colour, and sand, especially if there is any iron in it, alters the colour of the cups, especially in the *incomparabilis* and *Leedsii* sections. For early use the *spurius* are the best of the Trumpet varieties, together with Queen Bess of the *incomparabilis* type. Then follow Emperor and Empress with thirty or forty varieties, between which there is little to choose in point of earliness and which suit some one soil and some another. The early *poeticus* and their progeny come in at the same time, and the whippers-in are the late *poeticus* and *gracilis*. I am not going to crack up any new varieties or to advise you to get any particular variety by name. Some bulb-grower or retailer would be down on me with the accusation of making someone else the most favoured nation, or perhaps accusing me of undue preference on account of some unknown bribe. I have often wished that in collections of hardy flowers—especially of Daffodils—shown here, the position where grown, N. or S. of London, E. or W. of Greenwich,

height as regards sea-level, drainage, with any special atmospheric or climatic characteristics, should be given, as they have a great deal to do with the growth of plants, size of flowers, &c. ; and I do abominate the superfluous multiplication of so-called varieties and the consequent squeezing of the purse of a non-discriminating public. I think the Yorkshire story of the farmer who sold his old horse to a couper at a fair, then got very drunk on his good bargain, and bought him back at the end of the day with painted legs and filed teeth as a young horse, might have a kindred story among Daffodil-bulb buyers. Climate and soil alter the character of Narcissi to a great extent, but a couple of years will suffice for them to return to what they originally were. How far a sport may become fixed as regards its offsets, I am not in a position to say. After some ten years' experience I can say that I have never known a sport from a bulb, and I am inclined to think that so-called sports have been seedlings which have been mixed unconsciously with the bulbs, or have been in the ground where the offsets were planted.

And this brings me to another point—the hybridisation of Narcissi and the growing of them from seed. If anyone for amusement takes up this work, he should do it well, or he will not be helping science, and will get very little recompense for his labour. The necessary implements are as follows: a note-book, a pair of fine scissors, a camel's-hair brush with a glass tube to hold the same, and some labels. The method of working is to go out into the garden at seven or eight o'clock in the morning and select flowers which are just opening; cut off the ends of the perianth and all the anthers. When you have done as many as you want for that day, go in to breakfast; come out again at ten or half-past, collect the pollen for your cross in your camel's-hair brush, put it in the glass tube to prevent the wind blowing it off, fertilise your chosen flower, put a label to it numbered, and in your book record the number and the cross. Before using the pollen from another variety clean your brush by knocking and blowing the pollen off, and wipe the tube out with a bit of cotton wool. The most successful days for hybridisation are dry, sunny ones with no wind. Natural hybridisation must be among varieties which open at the same time, but artificial may be done between plants raised under protection and those out of doors; or if carefully done the pollen may be placed in dry tubes, corked

up and kept for a week or ten days. I have obtained seed supposed to be from such fertilisation, but as the seedlings have not yet flowered the fertilisation may have been by the wind after the attempted trial. If you wish to be successful, make the same cross with at least a dozen flowers, as seeding is not always brought to perfection.

Then the question comes in, What kind of crosses should one attempt? I believe for beginners it is the best to take natural species and to make the cross both ways, keeping a record of each, so as to see which produces the best results. But I find that out of doors, unless under very favourable circumstances, it is very hard to get seed. I advise people to abstain from using *muticus* for a cross either way, as well as all species which have secondary flowers of an imperfect or varying character. The difficulty of obtaining seed from many of the beautiful hybrids is very great. During nine years' observation with from 50 to 150 varieties, and from 5,000 to 50,000 bulbs, I have only in two summers saved seed from anything besides *pseudo-Narcissus*, *muticus*, *spurius*, *princeps*, and *poeticus*. In other seasons the seed-pods withered and came to nothing in June.

When seed has been produced, my advice is to sow it at once in deep pans and cover it with a quarter of an inch of soil; keep it in a frame in the shade, protected from rain, till the end of October or the beginning of November, then sink the pans in the ground and protect sufficiently to prevent the pans being split by the frost. Do not shift the bulbs till they have had two seasons' growth, and, if you live in a cold climate, three. You will find that the bulbs will have sunk quite half-way down a 5-inch deep pan. The average number of years before flowering with me is five, so that a considerable amount of patience is required. I hope that more people will try the raising of new varieties, as the oft-repeated failures of the many will cause the success of the few to be better appreciated. Nothing increases the value of anything so much as realising the difficulty of getting it.

But to proceed. Another point about the *Narcissus*, from a grower's point of view, is, By what general characteristics are we to classify the newly raised varieties? In judging the merits of those exhibited before this Society, I believe size, colour, shape, and constitution are all taken into consideration. Now I think size ought to be relative to some original form, colour to some class,

shape to some ideal, and constitution to some special hardness or adaptability to climatic circumstances. Flowers for exhibition should be grown naturally, not forced open by immersion in steam, nor highly coloured by being watered with dyes. Tricks have been played in such ways, but the study of cause and effect was taken out of me at an early age. A Spartan schoolmaster that I was under, who rejoiced in the North-country sandy hair, and who abhorred the effeminacy of a debased age, was one day inveighing against the *genus* school-boy, instead of hearing us our lessons, and informed us, amongst other things, that when he was a boy he greased his hair with his Sunday pat of butter. I remarked to my neighbour, unluckily, in a stage whisper, "That accounts for its colour," for which study of effect I was flogged. If it were not for this I might have been enabled to enlighten you further on this subject of artificial colourisation.

We can scarcely tell the proper effect of *Narcissi* when got up for show. We see the flowers shown staged in a bundle, all faces turned to a certain focus, and the foliage obscured, like the top of the grand stand at Epsom on the Derby day when the horses have just reached the distance. Many a beautiful outdoor flower is unsuitable for house decoration, and many *Narcissi* that are useful for decoration are ungainly when seen growing, from the length of their legs and the scantiness of their petticoats. Again, we must remember that many varieties suitable for the private garden are unsuitable for market purposes. As, for instance, the *Burbidgei* type—the most beautifully coloured of its race, but so fragile and tender that the flower is often crushed by its own weight in the bed, and if sent to market it is reduced to a shapeless pulp. I do wish that more people came to these Royal Horticultural Society exhibitions, and that they would learn to discriminate between the sorts of *Narcissus* shown. They would not then go to a florist's shop and pay the same price for the commonest varieties and the more valuable. The labourer is supposed to be worthy of his hire, but the Daffodil-grower has often to live at a loss.

Something ought to be said about the special enemies of the *Narcissus*, as well as the diseases the bulb is liable to, and the remedies to be applied.

The only special enemy I know is the *Merodon equestris*, which is in appearance like a small bumble-bee. How it lays

its eggs I cannot tell you, for if I see one, or any fly like one, I promptly kill it. I also destroy every chrysalis or larva I come across. When you take up your bulbs you cannot always tell which are infested with the larvæ, but if they are allowed to get somewhat dry the infested bulbs are much softer when pinched. If it is a common sort I destroy bulb and insect by first cutting it in half and then burning it, but if it is a valuable bulb I cut open one side of the bulb, pick out the insect, wash the bulb out with a small syringe, using a solution of fir-tree oil or Condyl's fluid, and then shake in some dry slaked lime. Even if the insect has eaten out the centre of the bulb, new bulblets will often form between the layers of the bulb and the top of the crown of the root. I have killed as many as fourteen or fifteen larvæ in a consignment of a thousand bulbs, and have found two chrysalids in a bag with only two or three bulbs in, though the bulbs themselves were sound. This shows how careful we should be to burn the packing which plants, &c., come in. The Narcissus mite I believe to be not a cause but the result of a disease.

As to diseases, rust is the greatest enemy to fear, and what brings rust is a disputed point. I can only speak of my own experience, and I believe that rust is sometimes caused by a superfluous amount of moisture in the bulb, which may come in different ways. In a cold, damp soil where the bulb has laid up a great amount of uncarbonised sap, and has evaporated none while at rest, if prevented from starting into growth, or checked in its growth, or taken up after it has begun to make new roots, it often develops this fungus, and how to cure it I cannot say. I have peeled the diseased layers of the bulb off, and scraped the fungus out of the root-crown; then put the bulb into dry slaked lime, let it get dry for a day, and then replanted it. In many cases this has been quite successful, *e.g.*, with *maximus* and with *Leedsi amabilis*, but, alas! it was of no use in the case of *cernuus*, double *cernuus*, and Colleen Bawn, and I mourn their loss to the present day.

But I must pass on to my last point. Ought there not to be some law or regulation as to the collection of wild species? Those who know many beautiful spots in the British Isles which are thrown open to the public, realise year by year what a destructive animal the tourist is. Ferns, Orchids, and bulbs are dug up and carried off, from the desire of acquisition, annexation, or

theft, whichever word you like to use. Some of them are thrown away by the robber because they look dead or are too much trouble to carry home, while others are planted where they have not the slightest chance of living. Few survive their ill-treatment. In other places, nearer large centres of population, sturdy beggars dig up Fern and flower roots to fill cheap wire-baskets, which they sell at an enormous profit, earning an easy livelihood without work. And if this happens at home, people may guess what happens in other countries. I suppose that landlords in Spain, France, Switzerland, and Italy love their wild flowers as much as we do in England, and yet I believe many a person who reviles the tourist who steals the Parsley Fern from Snowdon, and who would imprison the tramp who steals the Primrose roots from his hedgerow or his coppice, would poach with an easy conscience the rare *Narcissus* from the hillside of a foreign proprietor. I think that plant-collectors at home and abroad should be compelled to have a licence like a game licence, and, like that, it should not protect them when trespassing. If the propagation of rare species were the work of the market gardener instead of the collection of a beefeating plunderer, it would be better for the world in general. I should like to see the old rule as to English feasting applied to many other things. Enjoy as much as you can, but do not pocket anything. There is a vast difference between the collection of plants in a tropical jungle, which belongs to no one in particular, and the removal of them in a civilised country from ground which is the recognised property of someone.

THE FLORIST'S TULIP.

By the Rev. FRANCIS D. HORNER, M.A.

[Read April 19, 1892.]

THE last paper upon a florist flower—the *Auricula*—which I had the privilege to read at a meeting of the Royal Horticultural Society, received from illustrious quarters in the horticultural press the distinction of being considered sermonlike. It also took a line that was narrow, and set forth views that were cramped. This mild and balmy criticism affected me so deeply

that I shall easily incur it again in treating of the Tulip, as another classical flower of the florist, strictly so called. I offer no apology for our aim and work with our special flowers. I will only say that the results are much more Nature's work than ours, whilst in a "natural selection" we have each our share. It is very natural, and merely another version of "the survival of the fittest," that the florist should strive for and preserve those richest beauties of form and colouring which, but for his pointed endeavours, would still be lying latent within the capabilities of the plant. Rules and lines that never look harsh and hard, except perhaps in print and diagram, have mainly been laid down after, and not before, the flower itself has led up to them, or has even gone beyond them, and given us a higher standard than we ourselves had hitherto set up. Features, now disallowed, have come by their exclusion gradually. They first became weak points, then faults, because the flower itself has made them so. The notched petal of the self Auricula, the spot and bar upon the purity of the Picotee, and the stained base of the Tulip were all of them faults that grew graver by degrees as the flowers rose superior to them.

I do not propose to enter into the question of the origin of the florist's Tulip beyond saying that it is considered to be a descendant of *Tulipa Gesneriana*. I do not know how far that species varies in wild life, so as to afford any forecast of the variety in colours of the "ground" and markings that our forms of it possess. *Tulipa Gesneriana*, once shown at the Royal National Tulip Show as the original of our beautiful white- and yellow-ground classes, was a bright red self. In habit of growth, and time of flowering, the florist's Tulip corresponds with this species, but exhibits a wondrous variance from it in every property of form and marking that a Tulip can possess. In the original type, we see every feature the absence of which from the classic forms of the flower adds so much to their purity, brilliance, richness, and grace. There is the inky base which clouds the eye like an eclipse, and there are the stained filaments, which when pure, add so much to the distinctness of the bold black anthers.

It will be necessary to state as briefly as I can, the classification, points, and peculiarities of this most famous florist's flower, which beyond a generation back has probably had more time

and money spent over it than any other in the round of florist flowers of the olden time.

To the unfamiliar eye, a representative collection of these Tulips would seem to include two distinct species, which might be called, roughly speaking, plain and variegated. One bed will be filled with brilliantly marked flowers in which the ground colour is white or yellow, while the companion bed, though very gay, contains flowers of only one colour each, with here and there one that seems by its full markings to have been mis-planted from the brighter bed. These self-coloured forms have also distinctly greater height and vigour than their neighbours; and it is always more or less a difficulty for a stranger to the flower to believe, and still more so to understand, how these Tulips, so differently arrayed in one colour and in more, are not only one and the same species, but that bulbs of one and the same variety, direct descendants from one seed, are growing in each bed; but here in single and there in double colours.

I must revert to this extraordinary fact in the natural history of the Tulip when I speak of seedlings. It may be sufficient just now to say that the self-coloured forms, and those marked with some bright colour upon a ground of white or yellow, constitute the two most marked divisions of the florist's Tulip.

Taking first these double-coloured flowers, which by virtue of that attainment are technically known as "rectified," or "broken" flowers, they are classed according to the ground colour, and that of the marking of the petals. There are two distinct classes with a white ground colour, and one class with a yellow. The white cannot be too pure, and the yellow may be of any shade from lemon to rich gold, provided that it be of one shade in each variety; though we have still to bear with kinds in which the yellow ground is paler on the outside of the petal than within. Uniformity of the yellow adds greatly to the decisiveness, distinctness, and brilliancy of the flower, whether the shade be light or dark.

Of the two white-ground classes, one is distinguished by the markings being in some bright shade of red, from pink to rose and scarlet, and down to deeper cherry-reds; but the scarlet and what I can only clumsily call best-sealing-wax reds are the most prized. Heavy reds have not the glow and sprightliness, the rosy freshness and piquancy of the brighter tones, and are apt

to be heavily laid on or "plated," and to grow dull and dark with age. These white-ground flowers with scarlet markings are known as "Roses." They are our fairest, gentlest Tulips, the only class that has a sweet and English name ("Roses"), and they seem to exercise a softening influence among their fellow flowers—toning down the strong, fierce colours of the yellow-grounds, and cheering up the spirits, so to say, of the dark, cool, quiet, and sometimes almost gloomy flowers of the other white-ground class. Varieties in this class are called "Byblœmens." There is no great beauty in the word to English eyes or ears, and only its first syllable is in common use with us! The white ground of the "Byb." has markings in various shades of purple or violet, from light to almost black, and sometimes in a tone of chocolate-brown. The nearer black, the richer and better; but any suspicion of red is disliked, as infringing upon the province of the "Rose," and producing a kind of frontier flower, known as the "rosy Byblœmen," because the line of class distinction is not sufficiently kept clear. Such a flower may, in its latter days, be exhibited as an uncertain Byblœmen, or if kept dark under a flower-pot, be produced as a dubious "Rose"! It is eminently unsatisfactory either way.

Tulips with a yellow ground colour are termed "Bizarres," again a foreign word! The name, however, may be worth its significance, as representing a class which, in its ground colour, is out of line with its fellows, and in that sense "eccentric" or "bizarre." This is a very large and powerful class, with black and brown and scarlet marked flowers; and, until some better sorts are raised in the others, it will hold the reputation of containing the greatest force of first-rate Tulips.

All points considered, the best Tulip we yet have (at least in circulation) is "Sir Joseph Paxton," a Bizarre in both the "flamed" and "feathered" state. Of these three classes, distinguished by the differences I have mentioned, each contains two most important sections, formed by the two recognised and distinct arrangements of the marking upon the ground colour of the petals. As *colours* decide the *class* of the flower, so its *markings* decide its *position or character* in that class.

To be in perfect "character," the flower must be either "feathered" or "flamed," as the two distinct styles of marking are called.

A "feathered" Tulip is one in which the colouring is laid on in various and beautiful styles of feathering or pencilling round the edge only of each petal. The term is very descriptive of the light and graceful effect produced. The "feather" must not break off, or "skip," anywhere round the petal edge before it naturally ceases near the base of the flower. In lightly feathered flowers it is apt to be a trial for the pencilling to get safely round the petal top; and a slight beam of colour, descending a little down the petal centre from the top, is both allowable and helpful, as a kind of keystone to the arch of colour, strengthening it at the most critical point. Any stray dash of colour upon the main body of the petal is a fault according to its size or frequency; but a perfectly feathered flower, with a little colour in the wrong place, would rank higher than one with a spotless petal, but with a "skip" in the feather.

The character of marking known as "flamed" is of a much bolder and more figured type. It embraces all that the feathered form has, and something more. The "flamed" Tulip, in addition to perfect feathering round the petal edge, is endowed with strong beams or flames and flashes of colour springing from near the base, and striking boldly up the centre and towards the edge of each petal. Hence, again, the descriptive term applied to it—as if of a colour on fire. Where the feathering has long lashes, and the flame sharp tongues, the extremities of these strike and blend; but both flame and feather must allow room for sufficient of the ground colour to be left pure and clear between them, otherwise the flower is "heavy," with an overloaded look about it. There are endless mixtures of these two types of colouring. A good Tulip will sometimes perpetrate them, and is then said to be "out of character." Oftentimes bulbs of a sterling variety never produce flowers in good character, and these are known as "bad strains," and their high name goes for nothing, and they are dealt with accordingly.

Both pure styles of marking are very highly esteemed.

I know not which is sweeter; no, not I!

At first sight, the lovely and delicate "feather" may be the more attractive; it must appear so tender in touch, so spotless, so refined. In the flamed state, a few flashes more or less may not be so easily marked or missed. Still, there are those among

us who maintain that the perfect "flame" is the character more difficult and rare, and open to more shortcomings than the "feather," whose responsibilities at the petal edges the flamed flower has to bear, in conjunction with its own, on the body of the petal. These properties, greatly varied in colouring and style, form a floral picture of which the eye of the florist is never weary; though no doubt herein the non-florist critic will again find us ruling in the tyranny of narrow lines and harsh exactions. His presumable preference for the Tulip, splashed and blotched as wildly as if a bottle of black or red ink had been maliciously spilt over it,

We neither love nor hate.

The flower is capable of far more exquisite work than that—work more difficult, if I may use the word—work, too, that varies in detail every year, though I freely admit that our friend's ideal Tulip has its convulsions of Nature in an annual re-arrangement of its blotches—its inky islands in a white or yellow sea.

Continuing still

In ways that are dark, and in tricks that are vain,

in the estimation of our critics;—the Tulip must possess neither less nor more than six petals. Four make a square flower, five and seven a lop-sided one, and eight incline to the octagonal. The normal form of the Tulip cup is round, and in our particular type it should possess a good shoulder, with petals level at the top, and neither reflexing outwards nor curving inwards at their upper edges. The base of the cup inside must be white or yellow, according to the class of the flower, and free from any stain; and the filaments, upon which six bold black anthers stand, must be pure as the ground colour. This quality of purity has been gained after very many years of patient work with seedlings, and is indispensable now. The precise proportion for the cup of the flower has been a sorely vexed question. Anything shorter than the half of a hollow ball would give the flower a cropped appearance, and anything much longer would make it look narrow and top-heavy. The practical solution is that, although we would rather not, we still have to tolerate some long-cupped and narrow-shouldered varieties for lack of shorter ones possessing the same brilliant qualities in other properties. In other matters of form, the petals should be smooth

on the edge, and of good substance, that the colours upon them may appear dense, and the flower keep its shape. Breadth of petal is also a most valuable property; and but for sufficiency of this, the flower, as it expands and grows, would show strips of daylight through the base of the cup, a deadly fault known as "quartering."

Now that I have touched upon form and marking in the florist's Tulip, I would say that it was for long a controversy as to which of these two great properties should have precedence of the other. In those days, and speaking generally, the Southern florists assigned the first place to form, while the Northern men looked first to marking, and could not resist "a fine feather." I have always thought that these high virtues should be accounted twin graces of the Tulip, which we cannot justly separate, or fairly set in rivalry to each other. We want them both, and should work until we have them both combined in all our best Tulips. The absence of the one always detracts from the worth and beauty of the flower, in a way for which the presence of the other does not compensate. If they had been accorded an "equal first," and florists, instead of writing and contesting, had set to work unitedly for seedlings, in whose veins would run the blood of parents possessing between them both these high properties, and had had the courage to discard all their own seedlings that showed no advancement towards this combination, it would have been gained.

At present, marking is ahead of form, and no beauty of colouring looks its best upon bad form. I believe the absolutely perfect Tulip has yet to be raised, even so far as we can see, to say nothing of what the flower may yet have to reveal. We are in much need of both feathered and flamed "Roses" of shorter cup and better shoulder, and the same weakness exists in the Bybloemen class, in which the feathered flowers, highly valued and difficult to obtain, have but few among them of good form. There are some very correct seedlings in a few collections, but it takes a first-rate Tulip long to travel far from home.

Looking at the prize lists of our Royal National Tulip Society, I gladly recognise a streaky dawn of better things; but they are yet too full of old sorts possessing faults of form. From my own experience of years with seedling Tulips, I find them kindly inclined to come true to points, compared with such a flower as

the Auricula. Thanks to those who have worked before us, we have flowers of great purity to start with, and that quality is so impressed upon the flower now, that a stained base and filaments are not a very common fault. Those of form and substance are distinctly more so. The last two points are decided so soon as ever the young seedlings bloom; but whether perfect marking also will be gained is a question of further, and indeed indefinite, time. For though the seedlings were certainly raised from flamed or feathered parents, they bloom, with very rare exceptions, in some plain self colour; and under cover of this, all marking lies a hidden mystery perhaps for years. The flower will, however, suddenly put off this "undress" coat of colour, and assume the utterly different and more exalted character of the feathered or flamed estate. Form is unaltered, though stature is diminished. Only in colour the old order changeth, except that the circle of white or yellow at the base continues, as the heart and type of the new ground colour of the petals. Cinderella's fairy change was not so astonishing, complete, and beautiful as this new array of the rectified seedling Tulip. It is no chance sport, such as we may see in the Chrysanthemum, Carnation, or Rose. It is not that the original or "mother colour" is gathered together as it were, and in a shade intensified, arranged in feathery patterns on the petals. What change comes over the flower

Rings out the old; rings in the new.

The seedling Tulip may have a much longer childhood of colour than it had a childhood of age, and that was some five or six years. The change may even have come during some year of its bloomless childhood, which we can discern by the peculiar mottling in the leaf-tints that mark the rectified Tulip, but never the solid green of the unchanged self. This metamorphosis of colour, if I may for a moment be allowed a term that strictly belongs to change of form, is something for which I can recall no true parallel in any other flower. No analogy is close enough. The young bird moults the fluff and feathers of its chickenhood, and the grub becomes the perfect insect. But these have all their time for change, and the Tulip has not. This marvellous attribute of the Tulip is well known to every grower; and the novice accepts it as true, with the very milk of human kindness in florist friends who start him with a few good Tulip bulbs.

But I assure you that many a visitor to my Tulip blooms has looked at me, with shrewdness screwed up into one eye, and cold unbelief looking out of the other, when I have told the wondrous tale of Tulip changes. This fact in the natural history of the flower explains, as I promised to do, why a collection of Tulips may seem to some to consist of two distinct species, plain and variegated. The plain selfs are nothing more than the original and yet unrectified forms of the feathered and flamed varieties, and they do not change their name with their change of colour. For instance, there will be "Sir Joseph Paxton" in one place as a plain brown flower, and in another as a clear bright yellow, richly marked with black and amber. It is one and the same Tulip by both name and nature, only in the two distinct forms of its floral existence. So also with all other varieties, except newer seedlings or other sorts that as yet have never been seen rectified at all. Tulips while in plain self colours, are technically called "Breeders." The term may seem not very distinctive or descriptive, since it is a habit common to all Tulips in a greater or less degree; but I think it is associated with this flower through a well-known, and very tedious, habit of the seedling bulb in its earlier years, when it is presumably still in its self-coloured form, though still too young to flower. Throughout that period it is exceedingly prolific; in fact, it is entirely due to the peculiar habit of that time of life that it does not sooner attain to flowering size. Young seedlings well deserve the name of "Breeder," and it clings to them through life, so long as they flower in the usual "Breeder" state—that is, self-coloured. For, instead of each young bulb making a single new one of larger size, it produces several, each at the end of a hollow underground "pipe" as it is called; and these bulblets, which are termed "droppers," so divide the parental energies and substance that each has a very small income out of it; and living perforce within its means, for it has no independent ones of its own, it is often very little larger, and often not so large, as the parent bulbs.

The usual way of getting on with these young seedlings is to select only the best bulb that each makes yearly, until we obtain one large and wise enough to form a single successor within itself, and not a quantity outside.

I find, however, that it saves a year, perhaps two, to sow the seed very thinly in the open ground, allowing room for

much increase, and leave the bulbs in till they flower. The usual game of "droppers" goes merrily on, till the young bulbs feel, that if they drop any deeper, there will be suffocation, through their leaves never reaching the surface alive—and they will take care not to incur this. Seed may be saved from either rectified or self-coloured parents without affecting the habit of change, which is innate, and so is transmissible through either form.

It is worthy of note that in the Tulip there is no strain whatever upon the plant in allowing it to bear seed. The new bulb has nothing whatever to do with the seed-pod. It is all but complete when the plant is in flower, and is ripe before the seed-pod begins to swell.

It is merely an onlooker at any process beyond the bloom. The fibres and leaves have fed it, and the old bulb has worn out its life for its child. For all the new bulb cares, the leaves and fibres and stem may perish when it is fully formed; and they will, unless there is the further stimulus of a seed-pod to live for and lengthen the evening of their days.

The relationship between the white and yellow grounds is so close, and seedlings are so very sportive, that in their variations some will accomplish the feat of belonging to two classes at once. There are such combinations as the base colour of the Bizarre, and the body colour of the Byblœmen; or the pink of the "Rose" Breeder with the yellow base of that of the Bizarre. When such mixtures break, there will be three colours on the rectified petals, constituting the inadmissible flower termed the "tricolor." The feather or flame follows the class to which the body colour of the Breeder had belonged, that being its own exclusive gathering ground. But when the base colour, which here belongs to a different class, strikes up into the petals, driving away the old Breeder colour from before it, to give a new ground colour like its own, which is its prescriptive right, it encounters the interest and influence of the former occupier. Neither will quite give way, and the result is a compromise. The ground colour of such a flower, rectified, will be either a streaky mixture of white and yellow or some weak and washy compound of both.

I know I seem to have "given a catch" here, but I write advisedly, and will watch to see the critic "miss it"!

Where, in any Breeder Tulip, the base and the breeder colour both belong to the same rectified ground colour—say white—their influences are not in opposition when the flower breaks. It is not then the scene of a battlefield between white and yellow, but of a peaceful meeting between two of white-base blood, and the union may be strength.

We see the marks of conflict when these two powers are different, but not when their respective action tends one way.

In the way of tricolor Breeders, I have seen every combination but one—that of a white-base Breeder with a true Bizarre body colour. If this be a universal exception it is curious.

It is easily seen to which class a Breeder Tulip belongs “Rose” Breeders have a white base, with a pink or scarlet shade of ground or body colour. “Bybløemen” Breeders have also a white base, but their ground colour is some tone of lilac, slaty blue, or violet. “Bizarre” Breeders have a yellow base and a ground of bright or dull red, brownish red, or yellowish brown.

The origin of “strains” in Tulips is worth brief mention. Strains originate from the different styles in which each separate bulb of a variety will break. When any bulb rectifies or “breaks,” all the offsets formed that year take identically the same rectified character, and perpetuate that strain. However many strains may arise, they can only honestly go by the name of the Breeder they broke from. That received its varietal name from the raiser of it, and that is the only true name for all its subsequent stock, whether feathered, flamed, or Breeder still. It is from violations of this necessary rule that some of our Tulips have aliases—confusing, and perhaps criminal, in their way—arising from breaks of the same Breeder variety being named after the fancy of those who obtained them.

There is not time left now for cultural details here, not even if I gave them in telegraphic brevity. I fear also lest they would be of but limited interest, because comparatively few are the growers now.

Probably the counties of York, and Lancaster, and Notts contain the greater part of us; and there are some scattered growers ardent, successful, and florist-hearted, such as Mr. James Thurstan at Cardiff, Mr. David Barber near Nottingham, Mr. Haynes in the Midlands, and Mr. James Douglas in Essex, and

others, who grow the dear old florist's Tulip, of long history in the past, and associated with many cherished memories in us all. Such days as there have been, in Tulip-growing, seem hardly likely to come round again yet. Days when every county, and many towns and even villages in each, had its Tulip Society. Days of less distraction, both in business and in pleasure. Days they were of magnificently high prices too; though whether such brave sums were always realised, any more than in the mystery of music and songs, wherein the figure of the price printed has not been the figure of the price paid, I cannot tell.

The spirit of the old zeal and love is not fainter now. It is less abroad, but not difficult to find by those who wish companionship with it; and I am glad to say that for the last few years there is some perceptibly greater seeking after the florist's Tulip. Many names once familiar in the Tulip-world lie buried in the past, such as those of Groom, Goldham, Lawrence, Turner, Headly, Norman, Betteridge, Hunt, and others of the South; and of Northern growers of the past, Dr. Horner of Hull, Dr. Hardy of Warrington, late a President of the Royal National Tulip Society, and author of a standard work on "The Properties of Form in the Tulip." Among others of the North, well known, were Mr. W. Bentley of Royton, near Oldham, who knew all our wild as well as florists' flowers, George Lightbody of Falkirk, John Simonite of Sheffield, W. Willison of Whitby, J. D. Hextall, J. Hepworth, T. Storer, Battersby, Ashmole, Lea, D. Jackson, R. Martin, and many more. But among those I name are the growers who have raised many of the best flowers we grow now.

I think that, in Yorkshire, the greatest number of Tulip-growers may be found in and around Wakefield, with whom I connect such names of large, enthusiastic, and veteran growers as my friends George Gill, William Mellor, Jesse Hardwick, and others. In Lancashire, the neighbourhoods of Stockport and Oldham, and the regions round about Manchester probably contain the largest group of Tulipmen, among them my brother florist and friend Samuel Barlow of Stakehill, President of the Royal National Tulip Society, who has "kept the thing together" these many years with ever-kindly, generous, and guiding hand, and has been a father-in-the-flower to many a younger grower, myself among the number.

Others of us, in this "home county" of York, are widely

separated; and between my old friend Ben Simonite of Sheffield and myself there are nearly a hundred miles of Yorkshire ground between our gardens.

We all hope the old flower may grow into wider notice once again; but it is difficult to tell whether our losses, by age and death, are anything more than covered by the coming of new growers. One thing I hope—that there never will be a Tulip “boom.” We want steadier, riper growth than that. Booms have plenty of blossom, but are apt to shed their fruit untimely. So to speak, they don’t get over their “second swelling”! Time and fashion try them sorely. When novelty wears off, and hosts have joined subscription lists, and made long scores in catalogues, who yet care no more for one kind of flower than another, so long as it is something new to them, or fashionable; and when the omni-patient gardener is oppressed with plants for which he is allowed no due requirements, but is supposed, of course, to have to grow anything “sent in” to him—and does not; then all these unstable elements of an inflation drop away, and there is left, after all, little else than the men of love and patience, who were there before the “boom” began.

In them there stands the old, perhaps rugged, bearing-wood. It is from them—from influence of their zeal, and the pride and love they show in their favourite, and the quiet pleasure there is in the pursuit—that there is the greater hope of seeing a safe continuance, and not a short-lived, loud revival, of Tulip culture.

I hope the life of the flower will be safe in our day, and far beyond it; but I hope there will be no Tulip boom!

SUMMER PRUNING AND TRAINING OF FRUIT-TREES.

By MR. A. YOUNG, F.R.H.S.

[Read June 7, 1892.]

It has been said that the principle of summer pruning of fruit-trees is one of those phases in the successful cultivation of fruit grown in the open air upon which cultivators are not agreed. Certainly there is great diversity of opinion as to the time when and the extent to which the trees should be operated on, and there are some people who go so far as to question whether

summer—or, indeed, any—pruning is really needed. This being so, some would perhaps say, “If there is such difference of opinion, who is to decide which is the correct mode?” or, “If such differences of opinion exist, it can surely matter but very little whether summer pruning is practised or not.”

I am fully convinced myself that when it is judiciously performed summer pruning is one of the greatest possible aids towards the successful cultivation of fruit in the open air; and amongst really practical gardeners I do not believe there is any difference of opinion as to the system itself, but only as to the time and manner of performing it. At the same time there appears to be amongst some an increasing tendency to allow outdoor fruit-trees to grow with far greater freedom, and to allow them to assume what is called a natural form, with but little, if any, pruning at all. And this, I think, is an evil; for if trees are allowed to carry their whole natural free growth they will soon become so crowded that, instead of being able to produce fruit of fine quality, it will be small in size and poor in flavour, and only appear at the outer edge of the tree, and not equally over the whole, as it does when the growth is kept well balanced by judicious pruning, and light and sunshine have free access to all parts. There can be no mistake as to the ill effect, so plainly visible to all competent observers, of the rigidly pruned-in system; but do not let us go to the other extreme and allow the trees to grow into a tangled mass for the want of a little timely attention and restraint.

Considering the great extent to which the cultivation of fruit is now engrossing public attention, it will be as well perhaps to consider more at length which is the best system to adopt, and what advantages are likely to be obtained by what I may term a judicious system of summer pruning.

Summer pruning is not by any means a novel process, for, although the cultivation of fruit-trees has advanced considerably during the past few years, summer pruning in some form or other was practised years ago, but whether judiciously or not is at present an open question; though until quite recently the past generation of gardeners, or rather their practice, was held up to younger cultivators as a beacon light towards which they should all steer. Those bygone gardeners prided themselves especially upon their correct methods of training fruit-trees,

particularly those growing against walls ; but however clever they were in their training, the fruit was often only conspicuous by its absence. It has indeed been said that the time and attention these old practitioners bestowed upon their trees was more for the sake of extreme neatness of outline than for the production of fruit, as the fruit obtained was, considering the time bestowed upon the training, practically *nil*. Their bush and pyramid trees gave one the idea of topiary work, so shorn were they of extending growth throughout the season.

Now although I have a great partiality for a well-trained tree, yet I should not by any means commend a system or a tree which did not in due season produce fruit commensurate with the time and attention bestowed upon it. But, on the other hand, I say that those who denounce judicious training as being quite unnecessary are not advancing the best methods of manipulating fruit-trees. With trees growing against walls, for example, the better they are trained, the easier they are to manage afterwards, and the little extra attention bestowed upon them in their earlier stages is well repaid when they are once established, as a man can see at a single glance which shoots want removing and which not, and so he will not have to waste his time in pondering over the work, as he almost necessarily must do with ill-trained trees. Leaving out of sight for a moment the argument that well-trained trees are beautiful objects in any garden, I maintain that fruitfulness may be made to run on parallel lines with training, although in one sense, of course, the form the tree is to take is only of secondary importance, as it is the quantity and quality of the fruit produced, by which its value will be gauged.

The dwarfing stocks now largely in vogue have helped to revolutionise fruit-growing, or rather the pruning that is required, for with the advent of these stocks, which supplied a want long felt, trees suitable for the smallest gardens or for special positions could be grown of a small restricted size, and be also made fruitful without much pinching or pruning being necessary to produce them. It was the attempt to rigidly restrict the old trees grafted or budded on what is known as the *free stock*, which led to the abuse of summer pinching, as any attempt to dwarf trees on these free stocks by summer pinching or pruning only led to disastrous results ; the continual pinching or pruning only led to

the trees producing a thicket of shoots and unfruitful spray. Regularly as the season came round the trees had to undergo the same operation, with the same result of little or no fruit following. In the treatment of such trees as these grafted on free stocks we have made a decided advance, as it is now fully recognised that by allowing them freer extension fruit-buds are formed naturally, and the trees to a certain extent, and after a certain time, abandon their free or semi-wild mode of growth. Any kind of fruit-tree growing on the free stock may thus be made to assume a restricted form by being allowed a semi-extension growth. I have often been struck with the fruitfulness of Apples, Pears, and Plums growing in the open when allowed to have more of a free growth accorded them, but not to the extent of running wild so as to appear unkempt. I cannot sufficiently condemn what is by no means an uncommon occurrence nowadays, viz. the stepping right out of the groove of rigid pruning into the very opposite extreme of absolutely natural growth, without any attempt or thought of even thinning out the shoots, so as to allow light and sunshine to have free access. This is where fruit culture is in danger of being abused now, and it behoves those who undertake the culture of fruit in the open air to practise the best possible system whereby the trees may be made fruitful, and also produce it in such a form as will ensure good quality.

Before discussing the most suitable methods of summer pruning and training, I will just refer to the treatment of trees which have in the past been subjected to the most rigid system, and which are consequently almost devoid of fruit. They may be trained to walls or growing in the open as pyramids or bushes ; either will illustrate my point. Some time during the month of June a thicket of shoots will be seen growing from each tree, as the more they are pruned the more they appear to grow. The centres of those growing in the open will be found so thick that light can barely penetrate, and the natural and obvious result is that the main lengths of the branches are utterly destitute of fruit-buds, let alone of fruit. With such trees as these—and they are by no means uncommon—the most judicious and sensible course would be not to cut these shoots off wholesale, but to well thin them out in summer, even going to the extent of cutting out some of the main branches, so as to allow

direct sunlight to reach right up to the main trunk. There need not be any fear anent the future well-being of the tree through cutting out superfluous branches whilst they are growing, for the wounds will all become well callused over by the end of the season. By allowing the light to have free access at this early part of the year, instead of waiting until the trees are dormant, a season is gained, as the sun is enabled to exercise its benign influence on the foliage whilst in active growth; for, as is well known, no elaboration of the strength of the tree so as to produce fruit-buds can take place whilst the tree is enjoying its winter sleep. True enough, it is wise to look over the trees whilst they are at rest to shorten in or remove any obstructive branch, and with "standards" this is the most sensible course to adopt; but with what are termed "bush" or "pyramid" trees the case is different, as they are more easily got at, and one great advantage of pruning in summer is that what may appear a favourable distance apart for the branches whilst the foliage is off, presents quite a different appearance when the trees are in full growth, so different, in fact, as sometimes to make them appear quite crowded. Trees which are pruned during the growing season certainly require to be looked over at the winter season, but only to thin out a growth here and shorten a shoot there, so as to balance the growth or shape of the tree, and nothing more.

During the past few years I have allowed all our Plum-trees, bush as well as standards, to go practically unpruned, save the shortening of a branch here and there to balance the growth of the tree, and I never saw trees in a more fruitful condition, fruit-buds forming right up to the tips of the two-year-old wood; and though very little annual growth is made under this system, yet what there is, is short and fruitful. Now if these trees were subjected to rigid annual pruning a thicket of spray is all we should obtain for our pains. Cutting out branches wholesale after the fruit is gathered, where they appear too crowded, is a much better plan than shortening the shoots and "spurring in" the laterals, with the idea of producing formal pyramids.

As a general rule wall trees are the first to require our attention in the matter of summer pruning; and amongst these the "stone" fruits should have precedence, and the operator must be early amongst them, for if pinching, disbudding, or

pruning be neglected for any length of time, the trees very quickly become unmanageable, the basal leaves in many instances turning yellow and dropping off, on account of the exclusion of light. Trees growing against walls suffer from neglect much sooner than those growing in the open. These latter have light all around, whereas those on the wall get it on one side only.

Peaches and Nectarines need not be very specially referred to, as with these the principle is more readily understood, even if not always acted upon, and cultivators are more agreed on how the trees should be managed. In passing, I would say that it entirely depends on how the shoots are treated during the growing season, especially during the months of May and June, as to whether Peaches may be successfully cultivated on open walls or not. Crowding the shoots in the early stages, and the neglect of what is known as disbudding, are two of the main causes of failure; combined, of course, with the insects, for, as is well known, the Peach is prone to the early attacks of insect pests, and if their destruction is not persevered with during the first few weeks of the tree's growth there will be very few shoots left to disbud. It is the retention of the earliest shoots which is needed, as when secured they have the whole season in which to make their growth and to become efficiently ripened. The disbudding merely consists in taking off all shoots not required for the extension of the tree, and the retaining of one well-placed growth at the base of the fruit-bearing shoot, and another at the end to draw the sap. Never, however, lay in more shoots than will be required for the furnishing or extension of the tree, and all shoots retained should be well exposed to the light to ensure their being well ripened. After the fruit is gathered, the best course is to go over the tree and cut out what is known as old bearing wood and such as will not be required for the extension of the tree. By cutting out or pruning at this stage, if neatly done the wounds quickly heal over, and the shoots remaining are more fully exposed to the ripening influences of the sun and the air.

Apricots, Plums, and Cherries—except the Morello, which requires somewhat different treatment—these may all be referred to together, as the same general principle is applicable to each, all being adapted (when grown against walls) for the style

commonly known as "fan" training. They are all subject also to the evil known as "gumming," a disease peculiar to stone fruits, but which is more prone to attack them when the trees are subject to hard winter pruning, instead of to judicious pruning during the summer. The fruit-buds are formed on natural spurs, and also on the spurs formed by pinching or summer pruning, but the best course is to manage the trees so that these natural spurs will form plentifully, as they are more likely to produce both better and more abundant fruit than the pruned spurs are. What we have to consider, therefore, is, which is the best system to pursue so as to cause these natural spurs to form.

Commencing, then, with young trees, the cultivator should aim at securing a well-balanced tree, with fruit-bearing wood equally distributed over the whole surface, bearing in mind to get the wall also well furnished. All young trees when growing against walls have a persistent habit of a few shoots or branches trying to get quickly to the top of the wall at the expense of the lower branches, and it is generally a few of the leading ones towards the centre of the tree which acquire this habit. This supplies its own lesson, viz. to check these strong shoots, so as to throw the strength into the lower branches, for if this be not attended to during the earlier stages of the tree's existence it cannot be made to conform to it afterwards. The lower branches may require but little shortening when first planted, but the centre shoots must be checked, so as to secure a well-balanced tree. I think it is also a bad practice with trees of the stone-fruited section to train a shoot as a leader straight up the wall. If a young tree had six shoots I should train three on each side, leaving the centre open. If there should be an odd shoot, even if it be started in the centre, it should be cut back more severely than the rest, training the resulting growths right and left. Some people are of opinion that the shoots of a young trained tree when first planted should be laid in intact without shortening; but if such trees succeed in forming well-balanced growth, it will be found to be more the exception than the rule. It may appear out of place to refer to the shortening of these dormant shoots in a paper on summer pruning, but it is necessary to describe the formation of a young tree. In training the young shoots which are to form the main branches, each leader should be trained to take a straight course, so that it will not

interfere with its neighbour. Sufficient shoots must be laid in to form the framework, and where they are too thickly placed they must either be pinched back to form spurs, or, if these are not needed, cut them clean out with a sharp knife. Sometimes a shoot or two may be forging ahead at the expense of the others, and be causing them to be weakened thereby; if so, pinch out the points, but not otherwise. It is these equally balanced shoots, laid in intact, which form natural spurs. Some would shorten all these shoots back again, if only to the extent of just taking off the tips. But this is not the best course to pursue. If a shoot should want shortening so as to equalise the growth or to form extra shoots, shorten it, but not otherwise. By merely taking off the tips it causes a mop-like growth to form at the ends, and the lower part becomes bare. Natural spurs are far more likely to form when the shoots are laid in their whole length. Secondary branches must also be encouraged from the leading branches, but the same principle holds good with the whole. The crossing of branches, or the running into each other, must of course be avoided; but with the framework of the tree thus properly laid the summer pruning may be very expeditiously performed.

Allowing the young growing shoots of either Apricots, Plums, or Cherries to grow ahead until far into the season before being checked, results in the trees becoming gross and unfruitful, and when in due course they are shortened back, instead of assisting in forming fruitful spurs, it only paves the way for other strong shoots to follow, and the trees gradually merge out of their fruitful habit, and probably gumming ensues. With young trees, and especially Plums, there appears to be a natural tendency for the shoots to form more thickly towards the ends of the branches; therefore these should be pinched first, so as to equalise the sap more in the lowermost parts. All shoots not required for laying in must be pinched back to the fourth or fifth leaf, and after this first pinching any growth which may follow on fruitful trees rarely exceeds what is needed for the health of the tree. The growth needed is a kind of semi-extension, and if this will not bring the trees into a fruitful condition, or if the growth should be extra strong, through a too rich root-run, nothing short of root-pruning will bring the trees into a satisfactory condition.

Pears on Walls.—These are trained chiefly as fan-shaped, horizontal, and cordon trees, though there are several other forms, but the pruning of each will be very similar, or more or less so according to the different stocks the trees may be grafted on, as the Pear when on the Pear stock produces a far stronger tree, and pushes out more breastwood from the spurs, than when grafted or budded on the Quince. It is with Pears, I think, that the greatest errors of summer pruning have been practised, and it is the particular point which most needs clearing up. In their anxiety for extreme neatness, gardeners in days gone by commenced pinching the shoots as early in the season as possible, and the practice was repeated at intervals throughout the whole season, and the result was that fruit-buds were formed very sparingly. No amount of summer pruning or pinching will cause the formation of fruit-buds on the current year's growth.

It is quite evident that summer pruning must be practised, or the fruit-spurs against the wall would be deprived of light, and this is what is needed to ripen up the buds. It will also be understood that any Pear-trees which are growing strongly against walls, as old trees on the Pear stock are somewhat prone to do, will not be able to be brought into a fruitful condition through summer pruning alone. It is root-pruning which such trees require to bring them into a fruitful condition; and in passing I may say that I have seen some very successful experiments attending the root-pruning of old unfruitful trees.

During the formation of the young trees, and whilst they are extending, it is one of the greatest possible mistakes to pinch or shorten the leaders of the main branches before they have filled their allotted space, be they on the Pear stock or on the Quince. Just shortening the leading shoot has a tendency to form a bunch of shoots at the end, and leaves a vacant space of perhaps 18 inches without one lateral shoot or fruit-bud forming. Shortening back also has a tendency—even when done sufficiently closely to force all the latent buds at the base into starting—of giving the tree a gross habit, so that it does not come into a fruitful condition so early as it otherwise would; whereas by leaving the leader intact the buds will push out evenly, and, instead of growing into strong shoots, they will form natural spurs, and the tree will commence bearing much earlier.

In the case of cordons, the leader must be left to grow ahead unchecked until the top of the wall is reached, which has the result, as previously noticed, of natural fruit-buds forming along the whole length; but if they are shortened back, coarse spurs are apt to form, and these during the growing season throw out a quantity of breastwood. When cordons are starting into growth and are fairly well advanced there sometimes appears a shoot here and there growing strongly ahead, perhaps close to the top, and consequently the leader may be suffering on account of this strong shoot drawing away the sap. In cases of this kind it is much better to check these strong shoots, so as to equalise the sap and throw the strength into the leader. After a fairly long experience with cordon Pears, I find the best course is to go over the trees about the middle of June and shorten back the strongest shoots (not the leader) to about five leaves, allowing the weaker to remain as they are, and then towards the end of August to go over them again, shortening back to four leaves or thereabouts. If the trees are carrying a fair crop of fruit very little secondary growth will follow; but if it should, the bud at the end of each shoot will almost invariably draw off the sap, and so prevent the starting of what should be fruit-buds. The necessity of securing the leading shoots, so as to prevent injury from wind, cannot be over-estimated; this should be done early in the season, as if left for too long a time they cannot be trained in so evenly, and are also apt to be broken from not being so pliable. These are minor details, but they require close attention if well-trained trees are desired.

Coming now to the larger trained trees, such as fan-shaped, horizontal, palmette Verrier, or whatever the form, the principle is the same, even if the method be somewhat different. In training the trees take particular care to lay the branches in straight. With fan-trained trees in course of formation, it will be understood that a sufficient quantity of shoots to form the tree will not be able to start direct from the main stem, for if this were attempted the branches would have to be very close together to start with, and by the time they had reached the limit of the wall they would be very wide apart. It will, therefore, be necessary to shorten the leaders at convenient distances, so as to enable a well-balanced tree to be formed. With horizontals the central

leading shoot should be shortened back during the winter to about 10 inches, when three shoots will probably form at the top; if more than three form, thin them out to that number. The centre shoot should be trained straight upwards, and the two others right and left of it. The branches are generally trained 9 inches apart, this being three courses of bricks. If by chance only two shoots form, insert a bud during July in the vacant space. In the southern counties of England it may be safe to shorten the leader as soon as it has become firm, so as to form an extra pair of branches in a season, and I have known such shoots to turn out satisfactorily, but in the North this would not be a safe method to follow. During the formation of the young trees, if there should be a shoot near the leader growing ahead and so acting as a "robber" to the main shoot, do not hesitate about shortening it back.

As regards the summer pruning, it is the breastwood which most concerns us. Do not upon any account practice early pinching, thinking that by so doing fruit-buds may be formed. More probably such treatment will but add fuel to the fire, causing the growth of extra spray. The best course is to go over the trees about the middle of June, and shorten back all the stronger shoots to about five or six leaves, leaving the weaker ones untouched. Towards the end of August a general summer pruning should take place, all the shoots being shortened back to four leaves. Trees that are in a fruitful condition will not throw much breastwood, so that going over the trees twice will not take up much time. If the trees are only gone over once, there is the danger that if left too late it will cause the trees to become gross, and if done too early a quantity of secondary spray is certain to form, and by the end of the season the trees will have the appearance of not having been pruned at all.

Trees in the Open.—It is with the treatment of these that the greatest changes have occurred in people's ideas as to the extent of pruning necessary. There cannot be any gainsaying that, if we are to secure fruitful trees, the old system of close pruning must be abandoned. The more we prune the more we shall have to prune.

The amount of pruning really necessary will depend principally upon the formation of the tree during the first year or

two after being planted. If it is allowed to grow ahead without any check the growth will in most cases be unequal and crowded. But the early summer pruning of these open-air trees is a decided mistake, for when pruned or pinched early secondary growths will almost certainly follow, and these cannot possibly have time to become well-ripened wood, so as to enable their being retained as permanent shoots. Occasionally a shoot may require checking early in the season, but only on quite young trees, which may perhaps have a shoot or two growing too strongly ahead, while the weaker are naturally suffering for it, or at least being checked in their progress of assisting in forming a well-balanced tree. Trees which are being allowed to form a semi-extended habit should not require pruning before the end of August, and the amount necessary will, of course, be determined by the kind of stock the trees are grafted upon. Where Apples on a free stock and Pears on the Pear stock are allowed to have freedom of growth, they early become of fruitful habit, which they retain without making gross growth. At the end of August the growths will have become of a woody nature, and then any spare shoots, and those likely to crowd the centres, and so prevent light and air from having free access, should be pruned-in to three leaves. Any extending leaders which are growing too freely must also be shortened. The style of tree will indicate the amount of pruning necessary. The time for removing any solid branches which are crowding up the centre will depend principally upon the fruit hanging upon them, as no one would think of removing them until the fruit is all gathered. This is the time when all bush or pyramid trees should have a general overhauling, as any crowded branches may then be seen at a glance, and should be removed forthwith. The wounds quickly heal over, and the remaining branches would derive the benefit of the extra sunlight and air. This pruning must take place before the leaves fall, to be of any real benefit.

As regards Cherries and Plums, the thinning or pruning necessary for them will resolve itself more into thinning out any crowded branches and shortening rampant leaders, than to regular pruning, and by this course the trees will be enabled to become more fruitful than where close pruning is rigidly adhered to. By pruning during the month of September the wounds

quickly heal over, and do not become subject to gumming, a disease Cherries and Plums are very prone to if pruned whilst in a dormant condition.

I am aware that closely pinched or pruned trees may be made fruitful by regularly subjecting them to root-pruning, but I think the course I have detailed will result in more fruitful and healthier trees.

HARDY CLIMBING AND TRAILING PLANTS.

By Mr. W. C. LEACH, F.R.H.S.

[Read May 17, 1892.]

My object in the following paper is not so much to say anything new about climbing plants as to endeavour to bring back if possible to recollection and to favour some of the beautiful old garden favourites which of late years have been so much neglected.

The class of plants of which I have to treat contains some of the most interesting and beautiful forms in the whole vegetable kingdom. They are exceedingly varied, both in regard to foliage and flowers, and are admirably adapted for beautifying and covering walls, unsightly buildings, bare trunks of trees, old stumps, &c.; for trailing over verandahs and rockwork; for forming bowers and for covering summer-houses with a host of sweet-smelling flowers to mingle with the Ivy and other ever-green or deciduous Climbers.

As I have said, climbing plants have been very much neglected, and that not only in small gardens but in large ones also. Many large and extensive gardens, for instance, do not possess a single specimen of such a charming plant as the sweet winter-flowering *Chimonanthus*, or of the red and white *Escallonia*, or of such foliage plants as the grand *Aristolochia Sipho* and *Vitis heterophylla purpurea*, or the common Hop (*Humulus Lupulus*), to say nothing of those still more common plants, such as the old and beautiful *Wistarias* (blue and white varieties), the common *Woodbine* (*Lonicera*) and other sweet-scented *Honeysuckles*, which so often attract the attention of the

traveller or the artist when passing some humble cottage by the wayside.

Again, in regard to the covering of unsightly buildings, trunks of trees, old stumps, and walls that are not considered good enough for Roses, &c., in nine cases out of ten Ivy is the only plant used. Now Ivy is one of our most beautiful and useful Creepers, and I well know its value; but I must own that, to see the wholesale way it is used as a covering for bare spaces, one would almost think it was the only plant available for forming a natural tapestry. When rightly employed—as, for instance, on some old castle or church tower, creeping out of the reach of knife and shears—the Ivy is a grand plant; but, on the other hand, it should not be forgotten that while many trees are ruined by being covered with Ivy, some other Creepers, such as fast-growing Roses, Wistarias, Honeysuckles, Clematis of sorts, Aristolochias, Bignonias, Vitis, &c., rambling in all their natural beauty, would not injure the trees to anything like the same extent, and would be of the greatest possible advantage in the way of covering the trunk or stem of many an unsightly tree.

During the last fifteen or twenty years many Creepers have found favour in our large towns, particularly in London, and none more so than the Ivy, Virginian Creeper, and *Ampelopsis Veitchii*. These plants are well adapted to our smoky towns, and in hot summer weather have a very cool and refreshing look; while in autumn the bright tinted foliage of the *Ampelopsis* growing in company with the Ivy forms a most striking and beautiful picture. I am also pleased to see that the Clematis, particularly the purple one (*Jackmanii*), is fast growing in favour, and right well does it flourish even in smoky London. And I would here draw attention to the early-flowering class of Clematis, namely, the Florida group; these flower from May to July, blossoming on the old ripened wood. They should, therefore, not be cut down, but only have the weak wood annually thinned out. The Montana group also should be widely planted, as it will, like *Jackmanii*, grow very freely in almost any ordinary garden soil.

And while I am speaking of Creepers that will do well in and around London, I should like to mention a few others that I can recommend, namely, the beautiful Wistaria, *Garrya elliptica*, *Bignonia radicans*, *Cydonia japonica*, Escallonia of sorts,

Ceanothus, and *Jasminum officinalis* and *nudiflorum*. All these will thrive and flower well in London and the neighbourhood.

Amongst climbing plants less known, or at all events less grown, I would say, plant *Aristolochia Siphon*. This is a grand plant, quite hardy, and with its silvery foliage is a splendid object to behold. Many regard this *Aristolochia* as a greenhouse plant, but it is perfectly hardy, and I have seen it growing outdoors in Aberdeenshire quite unprotected. *Smilax* is another graceful twining plant suitable for covering trellis-work, &c., in London; so also are *Cotoneaster* and *Pyracantha*, and these two last, when covered with their bright orange-scarlet berries, are very beautiful during autumn and winter.

Well now, some will be saying, But what about climbing plants in the country, for if they will grow so well in London with its smoke and dust and dirt, surely they ought to fare still better in well-kept gardens in the country with its sweet pure fresh air and sunshine? Just so. But I ask you, Are they grown in the country in any quantity, or at least as much or as well as they should be? Why, many of our best flowering and foliage Creepers are almost unknown and ungrown; and, even when they are grown, they are in many gardens, both large and small, very much neglected, particularly as regards their pruning and training. Many a humble wayside cottage, almost covered with its *Roses*, *Woodbine* (*Honeysuckle*), &c., growing and flowering in wild luxuriance, will often put the nobleman's garden to shame as regards the natural beauty of the Creepers.

Roses have for a long time been great favourites—I mean the climbing section—and very rightly so, for who does not like the grand *Gloire de Dijon*, the pretty white and yellow *Banksian* *Roses* with their deep green glossy leaves; the lovely *Marechal Neil*, and a host of other fine varieties?—while for covering trellis-work and trunks of trees the beautiful *Macartney* and many other single *Roses*, if allowed to ramble at will, are a lovely sight when in flower. Very many people spoil these free-flowering *Roses* by pruning them too hard, thereby curtailing their free flowering. In the gardens that I have charge of, single *Roses* and many other climbing plants are never pruned at all, but are allowed to ramble at will, and they form one of the finest features in the gardens, and are thought much more of than other flowering plants that have a more formal habit. I am well

aware that many Creepers must be pruned ; but what I contend is, that in many gardens the pruning and training of Creepers and climbing plants is very much overdone. In many cases the plants are cut quite out of character, to say nothing of spoiling the prospect of a mass of flowers. Many a humble cottage has its Creepers that are a treat to see when in flower, yet in nine cases out of ten they are but little pruned.

As regards a collection of Creepers for a large garden, I would say grow all I have mentioned. Do not forget the Clematis ; they are not half enough planted. Give them a good rich soil ; let them ramble at will, particularly if they are to cover trunks of trees or rockwork.

For early spring flowering the lovely *Wistaria* is one of our finest Creepers for covering high buildings ; so also is *Cydonia japonica*, which in April and early May gives a wonderful splendour to the walls on which it grows. The sweet Woodbines (Honeysuckles) of the cottage should be more thought of in large gardens, including the varieties known as Large Dutch (*Lonicera Halleana*) and the scarlet-trumpet Honeysuckle. *Bignonia radicans* is also a charming Climber for a building or high wall, and forms a fit companion for Aristolochias, with Ceanothus to ramble at the foot of them. Also I would recommend the charming Escallonias, *Choisya ternata*, Jasminums of sorts for low walls, to be used with Ampelopsis of sorts and free-flowering Roses, and for a foliage plant the Exmouth variety of the Magnolia.

For a bright sunny wall *Passiflora carulea* is a rapid grower and a free-flowering plant of great beauty, and should have for a companion the beautiful Vine, *Vitis heterophylla purpurea*, for winter and early spring.

Pyracanthas planted in company with the sweet *Chimonanthus fragrans* are very fine Climbers, and if some of the variegated Ivies are allowed to grow with them they form a very pretty covering indeed. *Jasminum nudiflorum*, berried Cotoneasters of sorts, *Forsythia viridissima*, with *Simlax asperrima*, are all very beautiful in their season of flowering, while the non-flowering Creepers climbing among the berried plants all tend to show off the charms of their deciduous companions.

Garrya elliptica is a very beautiful evergreen shrub, and well adapted for the covering of walls. Its elegant pendulous catkins

are very beautiful, and if you plant with it the yellow and white Jasmine and some free-growing Roses, you can soon cover a wall or building and make it look well at all times of the year.

For covering summer-houses and verandahs, forming bowers, and the like, many Creepers may be used, such as Ivies of sorts, Clematis, common Hop, single and double flowering Brambles, Ampelopsis, and free-growing Roses, double and single. These, with many others, are of rapid growth, besides being alike sweet and beautiful, and if allowed to ramble in a natural way, with Sweet Honeysuckle entwining, you will possess a summer-house or bower that will tempt many a one to enter.

As regards soil and situation, nearly all the plants I have mentioned will thrive and flower in almost any garden.

There are many Creepers of a more succulent nature that are specially suitable for rockwork, &c., but these must form the subject of another paper, for even in the time I have already occupied I fear I have been able to do but scant justice to the beautiful class of plants of which I was asked to treat.

DISCUSSION.

The Rev. W. WILKS remarked that he had recently had some little practical experience with some of the plants mentioned by Mr. Leach in his most interesting and suggestive paper, as also with some others which possibly Mr. Leach even may have regarded as being only doubtfully hardy. Mr. Wilks having in 1890 put up an open verandah round the south and west sides of his house, planted it in the spring of 1891 with the plants mentioned in the following list, the effects of the winter of 1891-2 (when the thermometer more than once fell as low as 8°) being also noted :—

Plant	Effect of Winter, &c.
Magnolia Halleana . . .	No apparent injury; growth very slow.
Passiflora cærulea . . .	Points of shoots killed; breaking strongly.
Grevillea sulphurea . . .	No apparent injury; very sickly [since dead].
Poinciana Gillesii . . .	Killed back to old wood; breaking.
Akebia quinata . . .	Uninjured; evergreen; vigorous.
Desfontainea spinosa . . .	Uninjured; very little growth [since dead].
Clematis crispa . . .	Uninjured; vigorous.
Solanum jasminoides . . .	Points killed; breaking very strongly.
Ozothamnus rosmarinifolius . . .	Killed.
Mandevillea suaveolens . . .	Killed back; breaking strongly.
Clianthus puniceus . . .	Killed.
Lardizabala biternata . . .	Very hard hit, but living as yet.
Rosa gigantea . . .	Killed.

Plant	Effect of Winter, &c.
<i>Smilax aspera</i>	Foliage killed, but breaking from the ground.
<i>Ercilla spicata</i>	Points killed; breaking very strongly.
<i>Ceanothus Marie Simon</i>	Uninjured.
„ <i>Gloria de Versailles</i>	Killed.
<i>Escallonia Ingrami</i>	All strong autumn shoots killed; breaking well from summer growth.
<i>Grevillea rosmarinifolia</i>	Hard hit; breaking.
<i>Eucriphia pinnatifolia</i>	Uninjured.
<i>Rhynchospermum jasminoides</i>	Quite uninjured. [It has been full of blossom all the summer of 1892.]
<i>Azara microphylla</i>	Uninjured.
<i>Choisya ternata</i>	Uninjured.
<i>Carpenteria californica</i>	Uninjured.
<i>Lonicera caprifolium</i>	Uninjured.

The ordinary Jasmines, Honeysuckles, *Clematis Jackmanii* and others of its class, *Clematis montana*, and Roses, &c., are of course uninjured.

There is one plant which Mr. Leach did not mention and which I have not, but which should, I think, never be absent from any collection of Climbers, and that is *Clematis flammula*. It blooms in August and September, and though the individual flowers are small they are produced in such multitudes as to make the plant look almost like a sheet of snow, and it scents the whole air round for—I was going to say miles, but that would be exaggeration, but for a long distance indeed.

ORCHIDS FOR A COOL HOUSE.

By the Rev. E. HANDLEY, M.A., F.R.H.S.

[Read July 12, 1892.]

WHEN you casually mention that you are a grower of Orchids, the general public put you down either as a “Cræsus” or a very extravagant individual. The prevailing idea is that Orchids are not only expensive to buy, but that the cost of cultivation is such as to put them beyond the reach of most amateur gardeners.

The object of this short paper is to show that this is not the case. Some Orchids may be obtained and grown at no greater cost than ordinary greenhouse plants.

I. *Orchids are expensive to buy.*

This idea is engendered in the public mind by the reports, which from time to time appear in the public press, of Orchid

sales at which special and rare specimens have fetched abnormal prices. The public argue that as certain plants have been sold for three figures, therefore all plants of the same family will cost about the same sum. When you tell them that they are mistaken, and that while certain unique specimens have fetched these high prices, you can purchase many beautiful varieties for a few shillings, you are answered: "If I cannot have the best I will have none at all."

Is this your practice in other things? Do you, or your wife, discard china from your tea-table because you cannot have "Fine Sèvres" or "Old Crown Derby"? Do you refuse to place a bottle of claret before your friend at dinner because you cannot command the finest vintages of Leoville or Lafitte? No; you make yourself thoroughly happy with a bottle of some more humble brand. Yet with Orchids you need not take so low a place. Some of your less costly plants will be as beautiful, and as pleasure-giving, as the highest-priced rarities.

To be an Orchid-grower you need not be a collector of curiosities, neither need you aspire to have that which nobody else possesses.

II. *Orchids are expensive to grow.*

Orchids are connected in the public mind with great heat, and consequently believed to involve a large expenditure in fuel. It will be my endeavour to give you a list of Orchids, and how to grow them, which not only require a perfectly cool treatment, but are second to none in beauty and interest.

First let me describe the kind of house most suited for our purpose.

"The cool Orchid-house" is best, in my opinion, in the form of a "lean-to" as against the "span roof." The aspect should be north or north-west. The width of the house 12 feet, and as long as may be required to accommodate the number of plants proposed to be grown. The height at the back should not be more than 11 feet. The lights in front should be 18 inches, and *not made to open*. Ventilation, for which there must be ample facilities, is best secured by shutters let into the brick wall and working on a centre pin, so that the current of air may easily be regulated. These ventilators should be near the ground, so that in cold, frosty weather the air may be

mellowed by passing between the hot-water pipes. The top ventilators, running the whole length of the back of the house, should be about 2 feet wide.

I spoke of hot-water pipes. Although this is a cool house, pipes are required for the exclusion of frost in severe weather. Although the plants come from high latitudes, and places where there is intense cold, we must not forget that at home they have a natural "great coat" in a thick covering of snow. Growing them in an artificial state, denuded of their natural protection, we must guard against the action of frost on their exposed bulbs and foliage. This must be done by means of hot water. Have in your house four pipes, two flow and two return. Do not grudge the extra cost of this amount of piping. You might keep out the frost with half the quantity; you would, however, have to keep the pipes much hotter, thereby expending more fuel, and at the same time causing an excessive amount of dryness in the atmosphere, most injurious to the plants. With the extra piping, kept no hotter than you can bear your hand upon, you will keep the required temperature without dryness; you will save fuel, and the wear and tear of your boiler, and labour in stoking. The temperature of your house in winter should not fall below 36° or rise above 45° to 50° .

Far more difficult is it to keep your plants cool enough in summer than warm enough in winter. Outside blinds are indispensable. They should be of a substantial kind, yet of a make to exclude as little light as possible. I use a special fabric sold by Messrs. Williams, of Holloway. I know nothing like it, and though they cost more in the first outlay they will wear out those of the cheaper kinds. The blinds, fastened to rollers, should run on iron rods, screwed to the roof, so that there should be at least 9 inches of space between the shading and the glass, thus causing a current of air which will keep the glass cool. Do not be enticed into laying down a "pretty floor." Nothing is so bad as ornamental tiles and "all that ilk." They radiate heat, and, though nice to look at, are most injurious to the plants. My floors are nothing but the refuse from the gasworks, called in that part of the world "breeze," laid 4 inches thick on the bare ground, and ordinary wood lattice running down the middle for walking on. Such a floor, when damped, gives out that moisture in which Orchids delight. A good galvanised

tank should run under the stage to catch all the rain-water from the roof outside, as soft water is another requisite for Orchid-growing.

Lastly, the stages—and then our house will be ready for the reception of its inhabitants. These should be 4 feet wide, running along the front and back of the house. The front stage should be on a level with the bottom of the front glass lights; the back somewhat higher. The stages are best made of slate, supported on cast-iron pillars. Should, however, expense be an object, galvanised iron sheets may be used instead of slate. A covering of shell shingle, sold for the purpose, 2 inches deep, should be spread on the slates. A few wires stretched along the roof, for suspended plants, and our house is complete.

The next question is :

How shall we buy the Plants ?

The cheapest and most interesting way of starting a collection is to buy unflowered plants from the importers, either direct or at the sales by auction which are constantly taking place during the season.

Not only is this the cheapest plan, but it affords an innocent way of indulging in that nineteenth-century vice—speculation. My experience is that by obtaining newly imported plants from a reliable source you get a large proportion of good serviceable flowers, many which may be called excellent, while you stand the chance of drawing a prize of the highest order.

Again, many forms of flowers which would not do for the exhibitor's table are really more useful, when the object is the decoration of the room or the person, than the ideal blooms. Take, for instance, the ever-popular *Odontoglossum crispum*. The "starry" form, despised from the florist point of view, really lends itself to decorative purposes more readily than its highly prized relative with its round massive flowers; more readily, I say, because it is lighter in its effect—a great element of beauty—in vases or bouquets.

I now give a list of varieties which may really be called "Cool-house Orchids," i.e., those which may be grown *all the year round* in such a house as I have described :—

Odontoglossum crispum in its many	Odontoglossum aspersum.
forms.	" bictoniense.
„ Andersonianum.	" blandum.

Odontoglossum cordatum.
 " *constrictum.*
 " *coronarium.*
 " *Coradinei.*
 " *Cervantesii.*
 " *cirrhosum.*
 " *Edwardii.*
 " *Hallii.*
 " *hebraicum.*
 " *luteo-purpureum.*
 " *mulus.*
 " *nebulosum.*
 " *macranthum.*
 " *nævium.*
 " *Pescatorei.*
 " *polyxanthum.*
 " *ramosissimum.*
 " *retusum.*
 " *Rossii majus.*
 " *Schröderianum.*
 " *tripudians.*
 " *triumphans.*
 " *Uro-Skinnerii.*
 " *Warnerianum.*
 " *Wilckeanum.*
Oncidium cheiroporum.
 " *concolor.*
 " *cucullatum.*
 " *excavatum or aurosum.*
 " *Forbesii.*
 " *Gardnerii.*
 " *macranthum.*

Oncidium nubigenum.
 " *Phalænopsis.*
 " *serratum.*
 " *tigrinum.*
 " *undulatum.*
Masdevallia bella.
 " *Chimæra.*
 " *coccinea.*
 " *Houtteana.*
 " *Harryana.*
 " *Lindeni.*
 " *igneæ Massangeana.*
 " *trochilus.*
 " *Shuttleworthii.*
 " *Schlimii.*
 " *Roezlii.*
 " *Wallisii.*
 " *Wagneriana.*
Sophronitis grandiflora.
Cattleya marginata.
Lælia præstans.
 " *Dayana.*
Ada aurantiaca.
Mesospinidium vulcanicum.
 " *sanguineum.*
Mormodes Medusæ.
Maxillaria grandiflora.
Cypripedium insigne.
 " *Boxallii.*
 " *villosum.*
Pilumna fragrans.

And yet one more, though I confess that I have no success with it and consider it very hard to grow :

Epidendrum vittellinum majus. (Fig. 13.)*



FIG. 13.—*EPIDENDRUM VITTELLINUM MAJUS.*

Having obtained a collection from the above list, the plants should be disposed about the house in the following manner.

* We are indebted to Messrs. B. S. Williams & Son for the use of Figs. 13, 14, and 15.

On the first stage place the moderate-growing plants of *Odontoglossum*, mingled with *Ada aurantiaca* (fig. 14), *Oncidium*



FIG. 14.—ADA AURANTIACA.

cucullatum, the Cypripediums, and such plants as do not require much head-room. In the coolest, dampest part of the house have your colony of *Masdevallias*. The back stage will be occupied by the tall-growing *Oncidiums* (*macranthum* and such like), with the lovely purple *Odontoglossum Edwardii*. Your roof will be occupied by the dwarfest plants, such as the lovely *Odontoglossum Cervantesii*, with its many variations, *O. Rossii majus* (fig. 15),



FIG. 15.—ODONTOGLOSSUM ROSSII MAJUS.

with its rich flowers, the brilliant scarlet *Sophronitis grandiflora*, *Oncidium Forbesii*, and the Laburnum-like *Oncidium concolor*. The dwarfest *Masdevallias*, such as *Shuttleworthii* and other like plants, may be added.

Thus furnished, your cool house will be a "thing of joy and beauty," full of interest even at times when the bloom is comparatively scanty.

It would be impossible within the limits of a paper such as this to enter into details as to cultivation of each variety of Orchid I have named. For this I must refer you to some of the excellent books on Orchid-growing, only remarking that book knowledge must be supplemented by your own observation. Orchids are fastidious. Often when they refuse to grow in one part of a house, they will, for no reason that we can discover, do well in some other part of the same structure. This must be *observed*, and when a plant is not at home in one place try it in another. When you have found the place that suits it, *keep it there*.

The chief elements of success in growing Orchids lie under three heads :

1. The proper temperature according to the season.
2. Proper watering.
3. Perfect cleanliness, including pure air.

The cool Orchid-house is liable to three pests, which, though easily kept under by attention, are hard to overcome when, by neglect, they have got the upper hand.

1. Thrips. Every plant should be examined at least every three weeks and this pest sought for, especially in the axils of the young leaves. The Orchid thrip is so small that it often escapes notice, except through a magnifying glass. It stings the young foliage, which develops a black spot where wounded, which is never got rid of. A camel's-hair brush should be used, which, dipped in some insecticide, may be thrust into the hidden corners, and so the pest is destroyed. The foliage should be washed with weak soft soap and water. This treatment is specially necessary with *Masdevallias*, which are very liable to attacks of thrip.

2. Should green-fly make its appearance, fumigate with pure tobacco *at once*.

3. Slugs must be trapped with pieces of orange peel or carrot. A little cotton wool, fastened at the base of a flower-shoot, will form an impassable barrier to the slug in quest of flower-buds, to which it is most partial.

One more word of warning and I have done. *Do not be*

greedy. Do not expect your plants to do too much, either by flowering them too often or making them carry their flowers too long. Many, especially among the *Oncidiums*, will flower themselves to death if allowed to do so.

Have duplicate plants, and flower them alternate years. Another excellent plan is to cut the spike as soon as developed, and place it in a tube of water next to the plant; it will last very nearly as long as it would if not cut, and you will greatly relieve your plant.

Lastly, the question is asked, "Are not these Orchids very hard to grow?" I answer, No. They require attention, observation, and study, it is true; yet that study is full of interest, and leads the mind to inquiries into many kindred themes. Geography, so that we know the nature of the climes from which our plants have come. Chemistry, so that we may understand the nature of their requirements in the way of food, by which plant-life is strengthened and sustained. Botany, by which we can trace the various great families to which they individually belong.

Oh, but this involves much trouble! To that I reply, A hobby is not worth the name if it involves no trouble. Success would lose its sweetness if it were not the result of difficulties overcome.

INSECT-EATING PLANTS.

By MR. A. J. MANDA, F.R.H.S.

[Read July 26, 1892.]

DARWIN, Hooker, Henslow, Regel, Lindsay, and others have so well nigh exhausted the subject of insect-eating plants, that although I have had the opportunity of studying almost all of them, and of seeing many of them growing wild in their native homes in North America, I fear I shall not be able to say anything that is very new about them.

The principal genera included under the title of "Insect-eaters" are *Drosera*, *Drosophyllum*, *Dionæa*, *Cephalotus*, *Darlingtonia*, *Heliamphora*, *Nepenthes*, and *Sarracenia*. Included with these also are the Bladderworts (*Utricularia*) and the

genera *Roridula* and *Dyblis*, the former a South African plant and the latter a native of the tropical parts of Australia. These are all usually recognised as "insectivorous plants," and amongst these eleven genera there are a great number of species and almost innumerable varieties, many of the latter being natural hybrids; indeed, it is quite possible that, when our knowledge of hybridisation increases, many of the so-called species will prove to be only natural hybrids.

The Australian "Pitcher Plant" (*Cephalotus follicularis*) is a native of King George's Sound, and, although introduced to cultivation nearly seventy years ago, it is still looked upon as a great curiosity; it is also rather a rare plant in its native home. I have seen this plant, when under cultivation and covered with a bell-glass to keep out all flies and other insects, growing very much stronger, and producing pitchers of a far greater size and darker in colour, than ever I have seen in the case of recently imported plants of it, thus, in my opinion, proving that the greatest and best results with these plants are obtained by feeding them at the roots. In a wild state the plants, in all probability, grow in very poor soil indeed, and are then dependent, to a great extent, upon the supply of nutriment which they obtain from the flies and insects which they catch; but under high cultivation the roots alone will take up all that is necessary, and the extraneous supply absorbed through the pitchers is no longer needed.

Dionæa muscipula ("Venus's Fly-trap") may be taken as another example of precisely the same thing, as plants well fed at the roots, and from which all the insects have been excluded, I have always found to be the strongest, healthiest, and best, the leaves remaining in perfection and beauty much longer than any I have ever seen growing in their native habitat. I am not, however, able to say which set of plants would produce the most and the best seed. This *Dionæa* is a native of the sandy savannas of the eastern parts of North Carolina, and is noted for the extraordinary irritability of its leaves. These leaves have long foot-stalks and are bilobed at the top, each lobe being beset with a row of bristles around the edge. On the inner side of each lobe there are three hair-like projections, which, when irritated by an insect or touched by anything, will quickly cause the two lobes to close, like an ordinary rat-trap, and they will

remain shut up until the insect is dead or perfectly still, when they will gradually re-open and be ready for another prey.

Turning to the *Droseras*, or "Sun-dews," with which we are all more or less familiar from our British species *Drosera rotundifolia*, which is of a very small growth, and well known in all European gardens. There are a vast number of beautiful species in this family, spread over most parts of the world, but very few of them are as yet in cultivation. Among the few species we have growing, there is the fine Australian plant known as *Drosera dichotoma*, with its long branching leaves. *Drosera capensis*, again, is a superb plant, with its large oblong, spathulate leaves, thickly beset with deep viscid glands. I have also seen specimens of *Drosera lunata*, having beautiful lunate leaves, bearing long viscid glands. *Drosera filiformis* is another charming species; so are also many others which could be named.

Another very desirable and beautiful plant is the Portuguese "Fly-catcher" (*Drosophyllum lusitanicum*), a somewhat shrubby-growing species. It is common round the coasts of Spain and Portugal, and is also found in the Mauritius. It has thick fleshy leaves, 3 inches to 6 inches or more long, thickly covered with viscid, glutinous hairs, which catch a great number of flies. This species produces beautiful yellow flowers. I have never myself had this plant growing, but latterly it has become less scarce in English gardens, though it is, I fear, a plant that will not live long under cultivation.

The next genus I shall notice is *Nepenthes*—a family which, from their engrossing beauty, have gained for themselves a host of admirers. These plants have many absurd stories reported of them; one of the most frequent of these is that the plants always grow in dry places, and have the power of distilling water, and that when the pitchers become full the lid closes down, and serves as a resource for thirsty travellers; but all such fancies are simply absurd, and hardly worth recounting, for the plants grow really in swampy soils, and cannot endure a dry atmosphere. It is quite true that a liquid is distilled, so to speak, in the pitchers before the lids open, but when once the pitcher has attained its full dimensions the lid opens never to close again; indeed, in many varieties the lid or the operculum would not, by any means, be large enough to close

over the orifice. These plants are of great beauty, in some instances producing pitchers of very large size. Thus we have one kind from Borneo, *Nepenthes Rajah*, which is said to have pitchers upwards of a foot in length and measuring 6 inches across; and there are others of hardly less dimensions, beautifully ornamented with blotches and streaks of various shades of brown and red on a green ground. *Nepenthes sanguinea* is a rare but very beautiful plant, having deep-green leaves supporting pitchers which are frequently some nine or ten or more inches long, and of a deep rich crimson colour throughout. *Nepenthes Northiana* is another very beautiful and richly coloured variety, with glorious pitchers. *Nepenthes Mastersiana* is a superb hybrid, raised by Messrs. Veitch, between *N. khasiana* and *N. sanguinea*, having large reddish-brown pitchers of great size. Many other species might be enumerated, and all are beautiful in a greater or lesser degree.

I am not in a position to say what are the component parts of the fluid "distilled" by these plants before the lid of the orifice opens; but we are told that it possesses the same properties that are given off by the other "insectivorous plants" named above. It certainly has a great attraction for all sorts of insects, and I have frequently found the pitchers so filled with them as to have themselves become quite decayed and rotten through the decomposition of their contents. There is a wonderful variation in the case of the pitchers. Those which are borne upon the leaves at the base of the stem have broad wings, and the leaf-stalk comes up between them; but the pitchers which are borne upon the leaves higher up the stem become long and pointed at the base, the wings are quite absent, and the stalk is connected at the back of the pitcher. What is the cause or use of this alternation or difference of structure I do not know. The pitchers have a very cunning and highly curious interior, which entices the victim to its destruction; but here in our greenhouses at home they only serve as highly ornamental objects.

Nepenthes are plants which require to be grown in a hot and moist atmosphere, and I have found that they like an abundance of water to their roots during the growing season, and likewise overhead from the syringe; therefore the drainage must be exceptionally good and free in order to carry off the super-

abundance, so that nothing sour or stagnant remains about their roots. The soil should consist of equal parts of chopped sphagnum moss and good brown fibrous peat, which has previously had all the fine soil shaken out of it. The plants should be grown in a warm stove; the atmosphere should be kept very moist, and the temperature never allowed to fall below about 65° at any time. Water should be given in much less quantity during the winter months than in the summer, but even at this season they will require to be kept well supplied.

The *Sarraceniaceæ* include both the Californian plant known as *Darlingtonia californica* and the Guinea plant called *Heliamphora nutans*. These both differ from *Sarracenia* proper in the nature of their inflorescence as well as in the formation of their hollow pitcher-shaped leaves. The curious *Heliamphora nutans* has quite recently been imported and sold by public auction; and this is the first time it has been introduced into this country in a living state. It has pitchers with an oblique mouth and a small lid, the inside having long pointed hairs which are recurved, evidently constructed with a view to retain any insect which enters the orifice. This plant, being a native of Guinea, will require the heat of a stove-house.

Darlingtonia californica (the "Cobra Plant") is now well established in English gardens, having been introduced from its native habitat in California somewhere about thirty years or more ago. It has a hooded pitcher, something like *Sarracenia variolaris*, but twisted and turned downwards, and has hanging from its mouth a pair of lance-shaped lobes, giving it the appearance of a cobra snake—whence its name, "Cobra Plant." The pitcher is furnished on the inside with recurved hairs, thus insuring the retention of any insect which may enter. It, like the rest of these plants, grows in swampy places, and very often in poor soil, so that its insect-catching proclivities stand it in good stead.

The *Sarracenias*, or "Side-saddle Flowers," are all very beautiful plants, and are becoming more popular every year; and when they become still better known and understood, I feel sure they will be great favourites in English gardens. Like all other insectivorous plants, they inhabit heaths and bogs, where water is always abundant; but they grow more robust under cultivation, making more roots and forming far better specimens

than ever they do in a wild state ; and I am confident that it is more advantageous to the plants to be supplied with artificial root-food, instead of being dependent on the animal food which they catch in order to supply themselves with proper nutriment. They are very showy plants when in flower, and the large petals, which are red, white, and yellow in the different species, are very beautiful, whilst in one instance (*Sarracenia rubra*) the flowers give a delightful fragrance, very much resembling Violets. In the matter of cultivation, many people imagine that *Sarracenias* require strong stove-heat, but this is altogether a mistake. I have made these plants my special study, and I find them to do well under the following conditions. In the winter they should be rested in a close frame, with just enough heat to exclude the frost ; in such a position the plants are best plunged in fibre or sphagnum moss. In this way they get a thoroughly good rest, and do not require stimulating with water. Here they will stand from November until about the beginning of March, at which time they will begin to show signs of returning life, or to wake up from their winter sleep, when they require to be properly cleaned and top-dressed or repotted. They should now be placed in a moist house, near to the glass, in a temperature of about 60°, and during this time they will take a good quantity of water to their roots, and also overhead from the syringe on bright sunny days. Care, however, will be necessary not to use this instrument in a rough and careless manner, or the young pitchers will get bent down and broken. During the time the young pitchers are forming I like to keep the house tolerably close, avoiding cold draughts and all unnecessary rushes of air, for at this time the young pitchers are very soft and are very liable to injury ; and if the atmosphere is kept properly moist, both red-spider and black-thrips will be kept away. Green-fly should also be at once washed off, but tobacco should on no account be used for fumigating, as I consider it has a very deleterious effect upon the plants. As the pitchers increase in size and attain their full development, more air may be given and more sun allowed to shine upon them ; in fact, very little shading is necessary for these plants at any time, the bright light helping to colour the pitchers and bring out their proper tints, which in some species and varieties are very beautiful.

The best soil for *Sarracenias*, and, in fact, for nearly all

"insectivorous plants," is about two parts of good brown fibrous peat, some chopped sphagnum moss, some moderate-sized nodules of charcoal, and a portion of sharp silver sand, the whole thoroughly mixed and incorporated. The pots should be well drained; burnt breeze makes an excellent material, as it soaks up a great quantity of moisture and at once carries away any superabundance, and thus everything is kept in a sweet and wholesome condition, for anything stagnant about their roots soon causes these plants to assume an unhealthy appearance; the thrips and red-spider then take possession of them, and they look miserable and wretched.

Some few plants are recognised as species, all of which are natives of North America, and amongst these from time to time crop up varieties which have evidently originated from hybridisation by bees or other insects. One of the natural hybrids so produced I am able to exhibit to you to-day. It is named *Sarracenia Mandaiana*, and is one of the most beautiful plants amongst the whole tribe of the *Sarracenias*. It was originally discovered by me in a batch of *Sarracenia Drummondii* which we had collected, and it possesses certain evident marks which identify it as a cross between *S. flava rubra* and *S. Drummondii*; and it is not only one of the prettiest, but also one of the most distinct plants in cultivation. *Sarracenia Williamsii* is another plant that crops up from time to time amongst batches of *S. purpurea*. The majority of other hybrids are of garden origin, the outcome of the gardener's skill either in America or England, and very beautiful many of them are.

The following is a list of almost all the species, varieties, and hybrids of *Sarracenias* under cultivation at the present time:—

S. Atkinsoniana (*S. flava maxima* × *S. purpurea*).—A very fine hybrid, lined and marked with red, the lid especially being finely coloured.

S. atrosanguinea.—A grand hybrid.

S. Chelsonii.—A beautiful hybrid between *S. rubra* and *S. purpurea*; very pretty, and about intermediate between both parents.

S. Courtii.—One of the best hybrids raised. It was obtained by crossing *S. purpurea* and *S. psittacina*. The pitchers are small, and shaped like *S. psittacina*, but with the beautiful markings of *S. purpurea*.

S. crispata.—A supposed natural hybrid between *S. flava* and *S. rubra*.

S. decora.—Another very pretty hybrid, beautifully coloured.

S. Drummondii.—One of the most beautiful species in cultivation; pitchers long and prettily marked. There are two varieties, called *S. Drummondii alba* and *S. D. rubra*, which are very distinct.

S. excellens.—A very pretty garden hybrid between *S. variolaris* and *S. Drummondii*.

S. exulta.—A hybrid between *S. atropurpurea* and *S. Drummondii alba*.

S. exornata.—A hybrid between *S. purpurea* and *S. crispata*.

S. Fieldesii.—A handsome garden hybrid.

S. Flambeau.—A hybrid, and one of the best and prettiest.

S. flava ("Trumpet Flower").—A very strong-growing species. The pitchers are erect, very often reaching a height of 30 inches, and of a yellowish green colour. There are two well-known varieties, called *S. flava maxima* and *S. flava rubra*.

S. illustrata.—A hybrid between *S. flava rubra* and *S. Stevensii*.

S. Maddisoniana.—A grand hybrid, and very distinct.

S. Mandaiana.—A natural hybrid, and one of the prettiest of the whole family. It is perfectly distinct, and shows well the character of its two parents.

S. Mitchelliana.—A very pretty and attractive hybrid between *S. Drummondii rubra* and *S. purpurea*.

S. Mooreana, *S. Patersoniana*, *S. Popei*.—Three very beautiful and distinct hybrids.

S. psittacina.—The smallest growing species, and somewhat rare, owing to its being very difficult to establish.

S. purpurea.—This is commonly known as the Side-saddle Flower, and although perhaps the oldest known species, it is one of the most beautiful when well grown. The pitchers change from green to a beautiful purple colour.

S. rubra.—A tall-growing species.

S. Stevensii.—A beautiful hybrid between *S. purpurea* and *S. flava*, with fine stiff pitchers.

S. Swaniana.—A handsome and well-marked hybrid between *S. variolaris* and *S. purpurea*.

S. variolaris.—A very beautiful and distinct species.

S. Wilsonii.—A hybrid between *S. purpurea* and *S. flava*.

It is quite certain that all these plants have specially provided apparatus for insect-catching, with a view to the nourishment afforded to the plant by the absorption of the decomposed juices of the decaying animal—or rather insect-matter; but I do not consider the support thus naturally obtained in a wild state is equal to that which may be afforded through the roots alone by intelligent cultivation and the use of artificial manure. And, moreover, I have observed that the plants which catch the greatest number of insects sooner get disfigured by decay and other causes than those which are carefully kept from exercising their fly-catching propensities.

THE FUCHSIA: ITS HISTORY AND CULTIVATION.

By Mr. GEORGE FRY.

[Read August 9, 1892.]

THE first species of this charming genus was discovered and introduced to this country upwards of a century ago from Chili. It is said to have been brought by a sailor, who must have had a taste for flowers as well as a regard for those whom he had left behind in his native land.

In a paper read at a meeting of the Clapham Gardeners' Society in 1846, by Mr. E. F. Fairbairn, it is said that the sailor gave the plant to his mother, who resided in the locality of Limehouse, and that it was placed in her window. Here it attracted the notice of a gentleman who was riding past, and who a few days after had occasion to visit Messrs. Lee's nursery at Hammersmith, where, after viewing the thousands of plants in that establishment, he told Mr. Lee he had seen a much more beautiful plant in an old woman's window than any he had seen in his nursery. Mr. Lee thought the gentleman had over-estimated the beauty of the plant when he pronounced it to excel all he had seen; but when he told him that it was a dwarf bushy plant loaded with crimson flowers exactly the shape of ladies' ear-rings, Mr. Lee began to think it was some novelty, and inquired exactly where he had seen it. After the departure of the gentle-

man, Mr. Lee himself went down to Limehouse and found the plant in question, and inquired of the owner the price. The old woman told him her son had brought it home with him in his last voyage, and that she would not part with it for the "Indies of gold," because she never looked at the plant without thinking of her son. But Mr. Lee was so struck with the beauty of the plant that he would not take a denial, and offered her twenty pounds for it; but no, not fifty pounds would buy it. However, eventually he was the lucky purchaser for something like eighty guineas. He named it "*Coccinea*," and it was admired by everybody who saw it, and it is said that orders were at once obtained for three hundred plants at a guinea apiece.

The *Fuchsia* was named, according to Loudon, in honour of Leonard Fuchs, a famous German botanist, and the next introduction after *F. coccinea* was, he says, that of *F. lycioides*, also from Chili, 1796. Then came *F. gracilis*, 1823; *F. macrostema*, 1823; *F. excorticata*, from New Zealand; *F. parviflora*, from Mexico, 1824; *F. conica*, from Chili, 1825; *F. microphylla*, 1828, from Mexico; *F. bacillaris*, 1829, also from Mexico; *F. thymifolia*, 1827; *F. discolor*, from Port Famine, 1830; *F. arborescens*, 1824, described as a pink-flowering tree *Fuchsia*.

It was in 1830 that the first English hybrid was raised, viz. the old, and for years a special favourite, *F. globosa*. *F. recurvata* (recurved sepals), an Irish hybrid, came out in 1835, and *F. elegans* in 1836, which was supposed to have been a seedling from *F. globosa*.

In 1837 *F. cylindracea* was introduced from Mexico, also that grand old species *F. fulgens*, which was distributed by the same well-known firm of Messrs. Lee which had had the honour of sending out *F. coccinea*, the alpha of the genus *Fuchsia*. A few years subsequently, *F. corymbiflora* and *F. serratifolia*, said to have been discovered by Ruiz and Pavon at Muna in Peru, were introduced.

Since then very much has been done by hybridists in producing numerous varieties of great beauty, and such improvements have been made in the form and colour of the flowers as could scarcely have been anticipated in the early days of *Fuchsia* manipulation, although hybridists were apparently fully impressed even then with the great improvements which might result from their labours.

In 1839 William Knight, of Battle, in Sussex, at that time one of the leading raisers and growers of Dahlias, offered for sale some new seedling Fuchsias, viz. *F. bronzea*, *F. elegans superba*, an abundant flowerer, *F. globosa erecta*, and Goliath, a fine large variety, thus showing at this early date that gardeners were in earnest in their endeavours to produce new varieties; but it was Mr. Thomas Cripps who startled the Fuchsia-loving world by the announcement of his *Venus Victrix*, nearly fifty years ago. It was said to have been raised at Horsmonden, near Tonbridge Wells. Some have thought that this striking and quite distinct variety was a sport, and not raised from seed; but I am inclined to believe that it did come from seed, as was generally understood to be the case at the time. So rare and choice was this charming novelty considered that it met with an almost unprecedented sale at one guinea a plant. After the introduction of *F. fulgens*, I consider this period to have been, as regards the raising of varieties, the first great epoch in the history of the Fuchsia.

After this time the Fuchsia engaged the attention of gardeners in nearly all parts of the country. Fould, of Great Yarmouth; George Smith, of Tollington Nursery, Hornsey; Fowle, of Stockwell; Halley, of Blackheath; William Cole, of Blackheath; and subsequently one of our best hard-wooded plant growers, whom I well remember—Mr. Ivery, of the Hanover Nursery, Peckham, who sent out, amongst others, Sir Henry Pottinger, which was raised by my old friend Mr. Cole. Anon Mr. Banks, of Deal, became famous as a successful raiser of Fuchsias, and he achieved wonders as regards the habit of the plant and the colour and contour of the flowers. Fuchsias used then to be sent out in batches annually, and new varieties were eagerly looked for, sought after and purchased; and Mr. Henderson, then of Wellington Nursery, St. John's Wood, was in the foremost rank in distributing the latest novelties. Mr. H. Cannell soon stepped to the front as one of the most successful growers, and by his indefatigable industry and perseverance and love for the Fuchsia has very materially contributed to its popularity, and also to the perpetuation of numerous kinds which but for him would have long since been lost and numbered with the things that have been.

By far the most notable and interesting epoch in the history of the Fuchsia was that of 1855, when Messrs. Henderson

announced the distribution of the "white corollas," both double and single, which had been raised at Newton Abbott by Mr. Story, who died about the time his plants were being sent out. I think there was a batch of six, for which I understood at the time a hundred pounds were paid. How so great an achievement was attained we know not. Mr. Story having passed away, we are without any data as to how Fuchsias with white corollas were first produced. The process of hybridising had been practised for some years, and a great change in variety had been made; flowers with white tubes and sepals had been obtained, and the petals forming the corolla had been produced in various shades of colour, so that doubtless the constituents were not wanting which, under peculiar circumstances in the laws that govern the vegetable kingdom, would bring new forms into existence. Many characteristics that had hitherto been in embryo, or not fully developed, would thus be produced.

Of late years Fuchsias have fallen back in the ranks of generally cultivated subjects, the explorations of plant-collectors having added so many new things to our collections; and with many people there is an inherent disposition to throw aside old friends, in the plant world at least, for new. There is a mania that propels with electric-like force for a period, and then away we are driven in haste bordering on precipitancy. We must ever be seeking something new, something fresh; even the old names are expunged and new ones put in their place.

In the early days of Fuchsia growing, plant-houses were of a very different description to what they are now, and seemed peculiarly adapted to prolong the flowering season. I may mention, as an illustration, that about 1843 I had a very large conservatory under my charge, arranged and planted in winter-garden style with plants of almost every description. Amongst them were Fuchsias trained 14 feet high and upwards—such kinds as were then in cultivation, viz. *F. coccinea*, *F. gracilis*, *F. conica*, *F. corymbiflora*, &c.—and these gave a continuous supply of bloom during the whole of the summer months and late into the autumn. This old conservatory was 30 feet high in the centre, and one of the first plants of *Araucaria excelsa* introduced into this country was planted in the large central bed, with Camellias, &c. Here the Fuchsia did well, the place being lofty and partially shaded with vines trained under the glass.

With folding-doors at both ends and windows at the sides, ventilation was at all times an easy matter, and the temperature uniform. No hot, scorching sun, so inimical to the Fuchsia under glass, could reach the plants, save in a subdued and modified form. It was here that I first cultivated Fuchsias in large pots to decorate the terraces which surrounded the conservatory, *F. fulgens* being largely used. At the present time, decorative plants being so varied and numerous, and plant-houses of so totally different a style, rivals have, in many instances, supplanted the Fuchsia, save those grown in pots for the embellishment of the conservatory. And so it has come to pass that the Fuchsia does not hold such a prominent position generally as it did in the olden time.

To give cultural directions would seem almost superfluous, as the whole matter has been so frequently treated of. I may, however, just mention that the Fuchsia may be treated as an annual with the greatest success, and good blooming plants obtained in five or six months—aye, and many other plants may also be similarly manipulated; but, having been a raiser of Fuchsias for upwards of thirty years, it may not be out of place if I briefly detail my practice.

If the object be to raise seedlings of a distinct character, for the purpose of obtaining improved forms of flower and habit of growth it is absolutely essential to hybridise between such existing varieties as are likely to bring about a happy and satisfactory issue, care being taken that no foreign intruder intervenes to spoil the work. Plants with large flowers, but with a weak, spindly habit, may thus be improved on by using pollen from a robust habited plant. Strong growers may be rendered less strong and weak growers less weak. In raising the seedlings care should be taken that the seed is fully ripe. My practice has always been to smash the berry on the palm of the hand, and then pick out the seeds with the point of a knife; it is then placed on paper, and when dry put into small packets, labelled, and put by in a box till required for sowing. My practice is to sow about the middle of February, in well-drained pots or pans, and sometimes in shallow boxes. These are divided into compartments, according to the number required, and the little beds are subdivided by means of thin slips of wood. Each little bed is then labelled, the numbers corresponding with the

notes relating to pedigree, &c. This plan greatly facilitates the knowledge gained from the various crossings and the issues therefrom. The seed is sown evenly, and covered thinly with fine mould, and the pots, pans, or boxes plunged in gentle warmth, derived either from fermenting material or a hot-water tank. When boxes are used they are, of course, thickly perforated to allow efficient drainage, as the drainage of plants in every stage of growth is an important factor, and of paramount consideration in securing healthy development. After the seed is sown the pots, &c., are covered with pieces of glass, and paper on the glass, until the seeds have germinated and made their appearance, which will be in about from fourteen to twenty-one days. The glass and shading must then be removed, and air judiciously given, to insure a healthy growth of the seed-leaf. As soon as this has reached its full size, the young plants are very carefully pricked off, an inch apart, into 5-inch pots, half filled with potsherds; or frequently an inverted pot is used for drainage. The pots containing the seedlings are placed in the same position as before, after having received a watering with tepid water.

When the young plants have grown about an inch high, they are potted off singly into very small pots and returned to the propagating frame for two or three weeks, taking care to ventilate occasionally so as to dry up superfluous moisture and to prevent them from being drawn up weakly. When the roots begin to reach the sides of the pots the plants are shifted into 3-inch pots and arranged on a shelf in some warm position in the greenhouse, the shelf or stage being covered with cocoanut fibre, which is kept moist to prevent excessive evaporation. The young plants having arrived at this stage of growth, their subsequent treatment is precisely the same as that of those propagated by cuttings, and they will commence blooming in about five months from the time the seed was sown. Having treated the *Fuchsia* for years thus, it has always afforded me an immense amount of pleasure, some of the plants showing their bloom-buds when only about 6 inches high, and almost all of them making good decorative plants by the end of the season, and some few, perhaps, being worth keeping for their distinct character.

In raising seedlings, I had often wished that I could succeed

in obtaining a pure white one—*i.e.* white tube and sepals and white corolla; but though I did not succeed, I was pleased beyond measure when I found that so lovely a gem was being sent out by Messrs. Cocker, of Aberdeen, which was named “Countess of Aberdeen.” No more valuable addition has been made to the many thousands raised since Mr. Story raised those with white corollas. Its habit is excellent, being dwarf and bushy, and so floriferous that plants begin to bloom from the cutting-pot; but large plants may be had by judicious treatment, when care is taken to shade them from bright sunshine and by not exposing them too much to the external air. The lovely blossoms of this Fuchsia may be produced of as pure a white as it is possible to see in any white flower in cultivation; but to succeed in this respect attention must be paid absolutely to shading, &c.

The raising of seedlings, not only of Fuchsias, but of almost every decorative plant, which used to be the work of comparatively few, is now, with our numerous modern inventions and appliances, within the reach, not only of the professional, but also of the most humble amateur gardener. Looking back to the time when heating by hot water was scarcely known, or, at all events, in its infancy, the change to me is one of gigantic proportions, as everyone now interested in the beautiful art of horticulture is so well posted up in every branch. Seeds, once so difficult to obtain, are now articles of general commerce, at almost a nominal price; and whereas glass-houses in the olden time were only in the possession of the affluent and comparatively few, now you see even in the gardens of the artisan and cottager perhaps more glass than used to be seen in large places where professional gardeners were regularly employed.

Although the general cultivation of the Fuchsia is so well understood, I will venture a few remarks on propagation and general management; and here I must say that the facilities for propagating are now so much greater than they were fifty years ago, that hundreds—aye, thousands—of cuttings can be rooted in a few days, so readily can they be propagated in the year of grace 1892. Contrast with this the position of those of the old days, when even the propagating-houses of the nurserymen were pent-up and inconveniently arranged. Many had to do their

work with hot air and tan or other fermenting material, involving an immense amount of manual labour.

The cuttings of Fuchsias, as soon as they are grown of sufficient length, are taken off and neatly cut close under the joint, and inserted in mould of light texture mixed with a good portion of leaf-mould and silver sand. Cuttings will also root most readily in decomposed cocoa-nut fibre mixed with plenty of sharp silver sand ; in this latter I find that the rooting process, on a brisk bottom heat, is greatly accelerated, and the young rootlets more profuse. When the young plants are well furnished with roots, they should be potted singly into 2-inch or 3-inch pots, according to the strength and size of the plants. The compost used should be that of good, well-prepared top-spit from a meadow or sheep-pasture ; this should be incorporated with clean leaf-mould and gritty sand. The pots used should be new, or washed very clean and well dried before using. The plants, after potting, may be put back into the propagating pit, or in some warm, close corner of the house, and watered with a fine rose. Great attention must be paid to the watering. An occasional sprinkling will greatly facilitate the formation of new roots. When the roots have reached the sides of the pots, shift the plants into 4-inch or 5-inch pots, and place them in a more airy situation. Shading from intense sun must be strictly adhered to ; but should the external atmosphere be genial, air may be freely admitted to induce a healthy and sturdy growth. The subsequent treatment required is one of progressive shifting from one sized pot to a larger until they receive their final shift, using the soil somewhat coarser, and adding a little soot and a small portion of well-decomposed cow manure, or from an old mushroom-bed, in rather a dry condition. In potting it is of paramount importance that the potting mould should be in a happy medium state, neither too wet nor too dry ; and as it is well that the plants should receive no water for a day or two after the shifting, especial care should be taken that all have been well watered before the operation is begun. Should the top-spit of loam be of rather a close or retentive nature, a sixth part of good fibrous peat may be added with considerable advantage. As the plants come on, attention must be paid to stopping the shoots, so as to regulate the growth and make the plants assume a uniform shape, and induce them to blossom more abundantly.

As I have said, great attention must be paid to giving plenty of air and to shading when it is requisite. Permanent shading I repudiate; it makes the plant-houses, in my opinion, positively hideous, and can only be tolerated under quite exceptional conditions.

Many exhibitors at a certain time, when the weather is favourable, place their specimen plants out in the open, under a north wall or sheltered by a hedge or fence. This helps to check the growth and assists in producing an abundance of healthy well-coloured flowers. To succeed well with the Fuchsia a high temperature is disastrous. To take, perhaps, a wide range in this, I should say that from 50° to 75° is most congenial to the nature of the plant.

Change is the fashion of the day, and, regret it as we may, we no longer see in our greenhouses or in our exhibitions the beautiful specimens of *Ericas* and other hard-wooded plants to which we were accustomed in the olden time. And so, notwithstanding the number of beautiful and new varieties distributed every year, we must to some extent, I suppose, be content to see the Fuchsia similarly treated. Gardeners nowadays have neither the time to create nor the space wherein to bestow large specimen plants. So be it. But why should not smaller plants occupy their places? Neat, well-grown plants, well furnished with bloom, ranging from 2 feet to $3\frac{1}{2}$ feet high, can be produced with one tithe the trouble of large specimens, and at the end of the season they can, if thought proper, be thrown on the rubbish heap. Their time will have been short, but they will have been wondrously lovely during that little while. And if this simple idea could be viewed favourably, we should then soon see our exhibition tents and greenhouses enhanced by the great beauty that exists in the many improved varieties that are year by year sent out. This, indeed, would be to infuse new life into the Fuchsia.

It is well known that the older species used to be largely grown out of doors, and whole beds were devoted to such as *F. coccinea*, *F. gracilis*, *F. Ricartoni*, *F. conica*, and even *F. microphylla*. After the flowering season was over they were cut down and covered with leaf-mould or ashes to protect the crowns from frost. There was scarcely anything more graceful than such Fuchsias when in bloom, some of the plants being six or eight feet high. I have

planted out many of the new seedling varieties, both doubles and singles, with very effective results.

Whether the plants are grown under glass or out of doors, a judicious application of liquid manure is of great benefit when the soil is becoming exhausted. In the olden time the excrement of animals formed the staple material for this purpose, and the results were very satisfactory, but almost any of the chemical manures which are so abundant at the present day are equally effective if properly applied. The beginner should bear in mind in using these artificial compounds that it is far better to err on the side of moderation. It is easy to give the plants a second dressing if required, whereas a single too strong dose has been known to destroy every plant in the house.

I have not thought it necessary to give selections of the best varieties, as these are well known to all who make the culture of the Fuchsia a speciality; but as regards the beauty of a plant, it is the way in which it is grown that tends very materially to enhance its deportment, if I may so express it. I commenced my gardening career in the year 1832. Hence nearly all the varieties and sub-varieties of Fuchsias raised from the species first introduced have been produced in my time, and I am not slow to affirm that, could many of the now defunct forms be restored and grown as we now grow our special and choice favourites, they would show many points of merit and be of considerable interest. When taking a retrospective view of the past, I am astounded at the great work that has been done by those worthy gardeners and florists, many of whom I personally knew, but who have long since passed away.

BEGONIA CONFERENCE.

HELD IN THE SOCIETY'S GARDENS, AT CHISWICK,
AUGUST 23, 1892.

OPENING ADDRESS

By the Chairman, Mr. HARRY J. VEITCH, F.L.S., F.R.H.S.

IN the whole range of subjects which horticulturists have taken in hand with a view of effecting their improvement and their better adaptation for decorative purposes, there is not one, I think, which stands forth more prominently at the present time than the Begonia in its collective sense. To whatever department of decorative gardening we turn, we find Begonias represented in great force. For the hall and drawing-room the group of species distinguished by their handsome foliage, and the numerous mules and hybrids that have been raised from them, supply some of the most conspicuous ornaments. For the conservatory and greenhouse during the dull months of late autumn and winter, the free-flowering shrubby or suffruticose kinds afford a long succession of flowers of delicate and pleasing colours; and, more important than all these, we now possess a race of Begonias, derived from a group of Andean species, which rivals, if it does not surpass, in the gorgeous and varied colour of its flowers, the brilliant strains of zonal and other Pelargoniums which have so long held sway among summer bedding plants.

Let us glance backward over a period of about a quarter of a century, and call to mind what position the Begonia then held in gardens. The varieties with grey and bronze foliage of the Rex group were just then becoming popular, for their progenitors had been in Europe some years, and horticulturists, chiefly French and Belgian, had succeeded in obtaining, either by selection from seedlings of the same species, or by crossing *B. Rex* with allied species from the same habitat, several forms with

very handsome foliage. At that time there were very few natural species in general cultivation, and hybrids derived from them were comparatively few in number and of no especial merit. The old *B. Evansiana* * was still to be occasionally seen in the cottage window as well as in many well-regulated gardens; *B. hydrocotylifolia*, *B. manicata*, and one or two other Mexican species were cultivated in the stoves of those who could afford room for them, and several of the suffruticose species were appreciated as winter-flowering plants, but the genus, notwithstanding its great extent, occupied but a very subordinate place in the horticultural operations of that time. But a change, almost amounting to a revolution in its effects on the popular estimation of the Begonia, was at hand. At the period I refer to, a little more than twenty-five years ago, Pearce had sent to our firm four of the brilliant Andean species, the progenitors of the now familiar tuberous Begonias; one more had been introduced by Colonel Trevor Clarke and named after him; and a little later we received *B. Davisii*. With these species we commenced intercrossing, and in 1870 our first seedling was distributed under the name of *Begonia Sedenii*. Many here present doubtless have a recollection of these early efforts, and how popular the first hybrids became which we raised from these alpine species, and how soon it was evident that a new epoch in the history of the Begonia had commenced. The history of the origin and subsequent progress made in this group is so well told in Mr. Wynne's little book on "The Tuberous Begonia," that my further remarks on them will be restricted chiefly to observations on their latest aspects and their use.

Few plants are more easily recognised than a Begonia; its peculiar oblique leaf is so well marked a character that few observers are liable to fall into error respecting it. The obliquity of the leaf in the Begonia is not, however, peculiar to this genus, although more marked than in any other. It means simply this, that the mid-rib of the leaf is not its geometric axis, but divides it into two unequal parts (in *B. sccotrana* the obliquity is so much disguised as to be imperceptible upon a merely superficial view). Besides this the leaf is often curved, and when much narrowed it assumes a sickle-like shape; and when both the

* Nearly all the species and hybrids mentioned in the Chairman's address were illustrated by living specimens.—ED.

form and colour of the foliage of a plant are taken into account from a decorative point of view, the genus *Begonia* affords some very striking examples. Thus *B. falcifolia*, which we obtained from Peru many years ago, has sickle-like leaves six to seven inches long; moreover, the leaves are dotted with silver above and are reddish crimson beneath. It is somewhat curious that these long and narrow leaved *Begonias* should be so constantly spotted and coloured from whatever part of the world they may come, for so we find them in the old *B. argyrostigma*, *B. Wightii*, the recently introduced *B. Lubbersi*, and others. Very different from these is the race of *Begonias* whose foliage has a greyish tint with a rough surface. In others, again, the leaf is cut up into palmate-like segments, and these too are coloured and marked in various ways, as in *B. rubella* and others. Then we have others—as *B. Pearcei*, with some of its descendants, and *B. metallica*—with leaves having pale nerves and a glossy metallic surface; and others, on the contrary, with a rough surface marked in various ways with crimson, green, and silver. All these various forms and colours of the leaves (and many more instances could be adduced) have contributed to render many of the *Begonias* valuable as decorative plants for their foliage alone. One circumstance in connection with the foliage may be mentioned: the obliquity of the leaf, combined with the dull greyish-brown colour observable in some of the earliest introduced forms, suggested the popular name of the “Elephant’s Ear” for the whole genus, a name which seems now to have dropped out of use, but which was certainly common during the first half of the century.

But it is not the foliage alone that distinguishes the *Begonia* from other plants; the flowers have a structure peculiar to themselves, so much so that with the exception of a solitary waif and stray from the family that has been picked up on an island somewhere in the middle of the Pacific Ocean, and to which Professor Oliver has given separate generic rank under the name of *Hillebrandia*, the *Begonias* constitute a Natural Order by themselves, with no immediate relationship with any other family whatever. For the sake of clearness, a few simple facts easily observed in the structure of the flowers of the *Begonia* may here be stated. The flowers are what is called monœcious—that is to say, the staminate or male element

occurs in a separate flower from the pistillate or female element but both kinds are produced on one and the same plant. Now this arrangement, of course, necessitates fertilisation by subsidiary means, and this is doubtless accomplished in nature chiefly by insect agency. In glass houses it is mostly effected by hand, and, let it be noted, that this monœcious character of the *Begonia* has undoubtedly been of immense advantage to the horticulturist, for the fertilisation of the flowers (especially of closely allied species, or of varieties derived from a similar origin) can be effected with certainty, and with such prolific results that not only are progenies obtained very varied in their colours, but a sturdy race has been produced capable of withstanding the vicissitudes of our climate when fully exposed to it for several months in succession.

The stamiferous and pistillate flowers are also distinguished from each other by the number of their perianth segments, and still more so by the remarkable trigonal and prominently winged ovary of the latter. In the stamiferous flowers the segments in the cultivated forms are usually four, in two pairs arranged in the form of a cross, one pair often smaller than the other; but exceptions occur even among the cultivated forms, and especially in the small-blooming varieties, in which the stamiferous flowers have sometimes but two opposite petals, and in others the second pair is much reduced in size, and sometimes almost obsolete. The pistillate flowers, on the other hand, have, in the cultivated species and their hybrids, nearly always five segments of equal size. Remarkable deviations in the number of floral segments occur in *B. octopetala* and *B. polypetala*, two species from the Andes of Peru.

The effects of cross-breeding or of cultivation, or perhaps of the two causes combined, on the production of male and female flowers in *Begonias* have become evident in recent experience. In the absence of direct observation, we may assume that in the wild state the flowers of both sexes are produced in such a proportion as to ensure the perpetuation of the plant. Now some remarkable exceptions to this law have recently occurred among the late-flowering hybrids between *B. socotrana* and varieties of the tuberous group derived from the Peruvian alpine species; thus the varieties we raised called "John Heal" and "Winter Gem" have not yet been observed to produce female flowers at

all, and in a third form called "Adonis" the male flowers immensely preponderate.

In so large a genus as *Begonia*, it is not surprising that a considerable diversity of habit should be found among the species. By far the greater number are dwarf succulent herbs of perennial duration, those with fleshy rhizomes and tubers losing their foliage annually, whilst those that are suffruticose or scandent, as *B. fuchsioides*, retain their foliage for a longer period, a circumstance that greatly enhances the value of these kinds for decorative purposes in winter.

The number of species now known to science is probably not far short of 350, and of these it has been estimated that upwards of 150 have at one time or another been in cultivation, the majority of them in botanic gardens only, being apparently of little horticultural interest, and of the not yet introduced species, probably still fewer will be found of any use for gardens. But notwithstanding that so many of the species are never likely to be of horticultural value, at least in our time, there can be no doubt that they afford a wide field for experiment and trial. Of course, so large an assemblage of species under one genus, and dispersed over well-nigh one-third of the land surface of the globe, presents no small difficulty to the botanist who has to deal with them systematically, and hence it is that the sixty or more sectional divisions proposed by the eminent systematist De Candolle (most of which are evidently founded on very artificial characters), and the series in which the species have been arranged (founded chiefly on the characters of the androecium) by our own distinguished countryman, the late Mr. Bentham, although highly conducive to a more exact comprehension of the great family of *Begonias*, have little or no practical bearing from a horticultural standpoint; and remembering the vague sense in which the term "section" is often used in horticulture, its application to any particular group of *Begonias* is liable to be misleading, especially as any such artificial division may be broken through at any time by the hybridiser.

The *Begonias* are tropical plants, for although a few in South Africa occur beyond the southern tropic, and a much larger number are found in Northern India beyond the northern tropic, they all live under essentially tropical conditions. With respect to the geographical dispersion of the species, generally speaking

they occur in humid regions ; in the higher altitudes, as in the tuberous species from the Peruvian Andes, fully exposed to all climatic phenomena ; in the low hot valleys and in the islands, generally in shade. A large number of species occur at various altitudes along the great Cordilleras of South America and their continuation northwards beyond the isthmus ; another large contingent of species have their home on the coast range in Southern Brazil ; and another along the lower zone of the Himalayas in North-east India. There are also large numbers scattered over the West Indian Islands, the Malay Archipelago, the Philippines, &c. Begonias are altogether absent in a wild state from Australia, and so far as is at present known, there are scarcely a dozen species of African origin.

The horticultural history of the *Begonia* extends over a period of more than a century. The first species introduced into British gardens is said to have been *B. nitida*, which was obtained from Jamaica for the Royal Gardens at Kew in 1777. During the American struggle for independence, followed by the French revolutionary and Napoleonic wars, horticulture, like many other industries of that period, was almost at a standstill, and it was not till the Royal Horticultural Society had been some years established that a fair start was made in the career of general horticultural improvement. Yet during the forty years immediately following the introduction of *B. nitida*, several other species were introduced, and some of them figured in the two foremost periodicals devoted to the illustration of plants at that time, the now venerable *Botanical Magazine*, still in healthy vigour, and the *Botanical Register*, long since deceased. Thus under plate 284 of the last-named periodical we read that *B. suaveolens*, a West Indian species which we still find useful for winter decoration, was first cultivated by Messrs. Lee & Kennedy, of Hammersmith, in 1788, and two years later *B. acuminata* was introduced from the West Indies by Sir Joseph Banks. Then early in the present century Mr. Evans brought to England, probably from Southern China, the handsome species that bears his name, and this is the first *Begonia* figured in the *Botanical Magazine*, where it appeared in 1813. Several species are figured in both periodicals during the quarter of a century that followed, but few of them would now be considered of any horticultural merit, though not devoid of interest as novelties at the time. *B. argyrostigma*, the first

species brought into notice for its foliage, was cultivated by Mr. Colville, of Chelsea, in 1822. *B. insignis* and *B. semperflorens*, still retained in the list of winter-flowering species, were brought from Brazil in 1828, and four years later *B. sanguinea* was sent from the same country. About this time, but coming from a very different part of the world—viz. Nepal—*B. picta*, which deserves to be better known than it is, was cultivated in the Botanic Garden at Glasgow.

The first tuberous Begonia cultivated in British gardens was the aberrant *B. octopetala*, introduced from Peru in 1835. It is certainly a species that should not be lost sight of, for, although a somewhat coarse-looking plant, its flowers are large and should impart a new feature by hybridisation; in fact Froebel of Zurich has already raised some meritorious hybrids, in the parentage of which this species has participated, which are said to have a superficial resemblance to the Japanese Anemones.

During the decade 1840–50 some useful additions were made to the stock of cultivated Begonias, and, although some of them have since receded before more showy forms of later discovery, they have a claim to our recollection. Among the first of these was *B. coccinea*, sent to our Exeter firm in 1841 by William Lobb from the Organ Mountains. *B. albo-coccinea*, a still more handsome Indian species, with white flowers and red footstalks, was introduced in 1843; *B. fuchsioides* was sent by Purdie from New Granada to the Royal Gardens at Kew in 1846. *B. cinabarina*, a non-tuberous species with red flowers, was raised by Messrs. Henderson from seed sent to them from Bolivia by Bridges in 1850. In the same year *B. rubrovenia* and *B. xanthina* were introduced from North-east India, the first-named of these two with the larger petals of its male flowers veined with red, and the latter with yellow flowers and handsome foliage; the first is doubtless lost to cultivation, but the other is still with us, and has played its rôle as one of the progenitors of the foliage group of Begonias, in which also *B. Griffithii*, from the same region as *B. Rex* and *B. xanthina*, has also probably participated. With these three species should be associated *B. Thwaitesii*, introduced shortly afterwards from Ceylon, and *B. gogoensis*, which came later from Sumatra.

In the following decade (1850-60) a great stride was made in rendering the *Begonia* more popular. One of the principal causes of this was the discovery and introduction of *B. Rex* from North-east India, which followed closely upon the introduction of *B. xanthina*, the forerunners of the broad-leaved race of *Begonias* which have proved such valuable adjuncts for the decoration of plant-houses. It is unfortunate that the parentage of the most admired hybrids in this group was not recorded; and hence it is that those who wish to investigate the subject find themselves, on the very threshold of it, in hopeless despair of being able to elucidate it in anything like a satisfactory manner. It is unfortunate, too, that during the period now under review another element of confusion was introduced by the distribution of many *Begonias* with parti-coloured foliage under specific names to which they had not the slenderest right, being mostly but variations of or seedlings from a commoner type. Under *B. xanthina* var. *Lazuli* (*Bot. Mag.* t. 5107), Sir William Hooker wrote: "To this group belong the *Begonia Rex*, the *B. amabilis*, *argentea*, *Victoria*, and *Lazuli* of Linden; all these belong to one and the same group, of which *B. xanthina*, from Bhotan, may be considered the type, if it is not, as I am inclined to suppose it is, the common parent of all, assisted, as may probably be the case also with the *B. Rex*, by a cross with some pink-flowered species." This seems to be virtually all that we know about the origin of this fine race; and, although somewhat hypothetical, the passage quoted was written at a time when the earliest seedlings were being distributed and when the assumed parents were still comparatively new to cultivation. Among the handsomest and most distinct of recent acquisitions in this group is the variety called "Marie Louise." Of introduced species a small-leaved one from Penang, detected by Curtis, and, I believe, not yet named, is deserving of notice. It is worthy of remark that in all the modern forms of hybrid origin in this group, and probably in most of the earlier ones, the yellow of *B. xanthina* has quite disappeared from the flowers, a matter of no surprise to those who have experience in hybridisation among other genera.

We have now arrived at an epoch, which has been more fruitful in horticultural results as regards this genus than any that either preceded or followed it, for during the fifteen years

between 1864-79 were introduced the brilliant tuberous species from the Andes of Peru; the first hybrids from these were raised and distributed, and the forerunners were obtained of the splendid race which now occupies so prominent a place in the decoration of our conservatories and greenhouses, and also in out-door summer bedding. The strides made during this epoch and subsequently in the improvement of the tuberous Begonias have been often and well told, so that it is only necessary in this place to notice some of the salient points in the history of this remarkable triumph of horticultural skill. The first introduced species of the tuberous group (omitting *B. octopetala*, which has not participated in the parentage of the race) were *B. Pearcei* and *B. boliviensis*. These may be regarded as the two extremes of the series, and traces more or less distinct of the yellow flowers and bronze foliage of the first-named, and of the narrow petals and narrow leaves of the latter, are still perceptible in many forms. These were sent to our firm by Pearce in 1864. Three years later he sent *Veitchii* and *rosæflora*, found on the Andes at 11,000 to 13,000 feet elevation, and although they have not proved hardy in our climate, as was at first expected, they have undoubtedly contributed the leading characteristics of the race, and have chiefly imparted to it the robust constitution which has rendered it so valuable for bedding. The parentage of the first raised hybrids was carefully recorded, and from this simple cause alone our knowledge of this race of Begonias is far more complete and satisfactory than that of any other popular race of herbaceous plants. Later we introduced the brilliant but small-flowered *B. Davisii*, of dwarf habit, from which, by crossing it with some existing hybrids, some brilliant forms were raised, and from these again have been derived some of the darker and dwarfer forms in cultivation.

The series of hybrids distributed by our firm between 1870 and 1880 formed the foundation (probably with further admixture with the original parents) of the magnificent race we now possess, which by the energy of French and other hybridists have reached a development quite unlooked for at first.

That the influence of cultivation in the production of double flowers should be manifested in the Begonia was to be naturally expected, and the appearance of the first two raised by Mr. O'Brien at Messrs. Henderson's was an event of much interest,

and the marked improvement since attained in the double-flowered varieties attests the amount of energy that has been applied in that direction.

The latest aspect of the tuberous Begonias is seen in their adaptability for summer bedding. There are now crimsons, scarlets, rose or pinks, whites and yellows, and, to use a florist's term, all these colours are "fixed," although it must be confessed that the yellows are not so satisfactory in their blooming out of doors as the others. One great advantage of the tuberous Begonias for bedding purposes lies in the fact that whether the weather be wet or dry the bloom remains for a long time in perfection, and so proving much more useful and satisfactory in the garden than their older rivals, the Pelargoniums.

I have but a word more to add on the tuberous group. In contemplating the splendid results now so manifest, one cannot help feeling regret that the original types to which we owe them have practically, if not entirely, disappeared from cultivation. But so it is—unless, perchance, some of them still find a resting-place in some botanic garden or in the collection of some careful amateur. In the group of species and hybrids I have brought together to-day for illustration (for many of which I am indebted to the kindness of Col. Beddome) they are conspicuous only by their absence.

In alluding to Begonias as bedding plants, mention should be made of a very useful group represented by *B. semperflorens* and its varieties, and also by *B. Carrierei* (two forms), growing but a few inches high and blooming most profusely. These are admirable for edgings to beds of which the centres are filled with their larger congeners or other plants. They are also specially suitable for forming a floral carpet amidst which can be dotted specimens of various kinds of sub-tropical bedding plants. I know of no happier combination, for instance, than such a carpet with plants of *Acacia lophantha* as reliefs.

The prominence acquired by the tuberous Begonias during their rapid development into the splendid forms we are now accustomed to, threw into the shade for a time some interesting species discovered and introduced while that development was in progress. Among such are *B. geranioides*, a pretty species from South Africa; *B. Dreggei*, also from South Africa, useful for winter decoration, and which Mons. Lemoine, of Nancy, has used

for hybridising with promising results. Then we have *B. Sutherlandii*, a tuberous kind with coppery-red flowers, introduced from Natal in 1866. *B. Froebelii*, a handsome species obtained shortly afterwards from South America, but which appears to be a very weak agent in hybridisation. Nor must we omit to mention *B. corallina*, one of the handsomest of all Begonias both as regards flowers and foliage. Its origin is unfortunately obscure, but probably it came to us from Brazil—a country most prolific in beautiful and distinct forms, among which are *B. Martiana* and the recently introduced *B. Scharffii*, *B. Haageana*, and *B. Lubbersii*, all well worth the attention of cultivators. There is still one more natural proliferous species with distinct foliage and curious inflorescence whose horticultural merit has not yet been proved; this is *B. Burkei*.

Of late years a highly decorative race of Begonias both in foliage and flowers has originated on the Continent, chiefly in France. One of the first was raised by Messrs. Thibaut & Keteleer, and called by them Gloire de Sceaux, and subsequent additions were made by other hybridists, one of the best bearing the name of Arthur Mallet. In this race the characters of the Indian species *B. subpeltata* (allied to *B. Beddomei*) are very prominent, and as *B. subpeltata* was much used, the group may without impropriety be called the *subpeltata* group.

There yet remains to be noticed one of the most remarkable of recent introductions, because its influence as a progenitor of new races is far-reaching and perhaps only just beginning to be felt; this is *B. socotrana*, brought by Dr. Bailey Balfour in 1880 from the dry and hot island of Socotra, off the south coast of Arabia—"one of the last places in the world," as Sir Joseph Hooker remarks, "in which a Begonia could have been expected to occur." Not only is its geographical position remarkable, and even anomalous, but its systematic place in the genus is not easily determined. As a garden plant it has proved to be one of the most useful of Begonias. Itself a handsome species, flowering in mid-winter, by crossing it with late-flowering varieties of the Andean tuberous group, the forerunners of a most valuable race of winter-flowering kinds have been obtained, and such varieties as John Heal, Winter Gem, and Adonis are already highly appreciated. Nor is it with the geographically remote tuberous Begonias only that *B. socotrana* has proved a

potent agent in hybridisation, but it has also been crossed with other species of a very different character—for example, the Brazilian species *B. insignis* and the Indian species *B. Rex*.

Among our various experiments in the hybridisation of Begonias some very curious and unexpected results have been obtained. Thus *B. socotrana* crossed with *B. Froebelii* produced seedlings that were all *socotrana*, the influence of the pollen-parent being nowhere perceptible; and when *B. Froebelii* was crossed with one of the brilliant dwarf hybrids in the parentage of which *B. Davisii* had participated, the resulting progeny was entirely *Froebelii* apparently unmixed. An opposite result occurred in crossing *B. gogoensis* with *B. albo-coccinea*, when none of the seedlings were distinguishable from the pollen-parent (*albo-coccinea*). Thus in one case out of three the pollen-parent predominated, while in the other two it was quite lost. A very interesting cross is seen in "Novelty," which was obtained from one of the *B. Davisii* seedlings crossed with *B. lineata*, a species from Java; and a still more remarkable one has been raised from *B. socotrana* \times *B. Rex*.

Although the subject is far from being exhausted, I believe I have adduced sufficient instances to show the important place occupied by the Begonia in its collective sense in the horticulture of the present day. Let us hope that when in the years to come we again discuss the genus in its horticultural aspects, many further experiments and trials will have been made and borne good fruit; but let me particularly impress on all who shall interest themselves in such experiments the great—the paramount—importance of carefully recording at the time every step taken and every result obtained.

THE CULTIVATED SPECIES OF BEGONIA.

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NOTES ON THE GENUS.

THERE are about four hundred species of *Begonia* distributed over the tropical and sub-tropical regions of both hemispheres. They are most abundant in America, especially in Mexico and Brazil, De Candolle enumerating a hundred species in Martius' "Flora of Brazil," and Hemsley eighty-four in the "Flora of Mexico and Central America." India appears to come next, Mr. C. B. Clarke admitting sixty-four species in the "Flora of British India." There are a considerable number in Africa, seven species being known in the Cape region alone. None have been discovered in Australia, but there are *Begonias* in the adjacent islands of Borneo, New Guinea, Java, and Fiji. There is, however, a fragmentary specimen in the Kew Herbarium which was sent by Sir F. von Müller in 1883 as a *Begonia* which had been found near Laguna Bay in Queensland.

The botanical position of the order *Begoniaceæ* is between the Cucumber family on the one hand and the Cacti on the other. Besides *Begonia* there are two other genera comprised in the order, viz. *Begoniella*, a Colombian genus of three species, remarkable in having flowers with a campanulate corolla, and *Hillebrandia*, a monotypic genus native of the Sandwich Islands. *Begoniella* has not yet been in cultivation, but *Hillebrandia* was introduced a few years ago and flowered at Kew. There is a figure of it in the *Botanical Magazine*, t. 6953.

The following botanical description of the genus *Begonia* is taken from the "Flora of British India," with apologies to Mr. C. B. Clarke for some slight alterations:—

"Succulent herbs or undershrubs; stem often reduced to a rhizome or tuber. Leaves alternate, more or less unequal sided, entire, toothed, or lobed; stipules two, sometimes large, frequently deciduous. Peduncles axillary, divided into dichotomous cymes. Flowers white, rose, crimson, or yellow, showy, sometimes small, monœcious. Male flowers generally of two large

outer and two small inner petals (to simplify matters I propose to use this term for all the flower segments); stamens often numerous, free or united into a column, anthers obovoid. Female flowers of from two to ten petals. Ovary inferior, 2-4 celled; styles 2-4, with branched twisted stigmas. Fruit a capsule, generally 3-angled and winged. Seeds very numerous, minute."

For horticultural purposes the genus may be roughly divided into three groups:—

1. Species with perennial stems; example, *B. nitida*.
2. Species with a tuberous rootstock, no stem, and ever-green foliage; example, *B. Rex*.
3. Species with a tuberous rootstock and annual stems and leaves; example, *B. Veitchii*.

Before dealing with the cultivated kinds it may be worth while to glance at the most striking features of the genus as a whole, for, although very well defined in its main characters, it exhibits great range of variation in stems, leaves, flowers, and fruits. In the first character, the stem, we have species which form sturdy shrubs, others which send up long bamboo-like stems, copiously branched at the top, others with tall succulent stems which rarely branch; in *B. scandens* we have a plant which mimics the Ivy in its habit of climbing and clinging by means of tufts of ærial roots. Then we have the short fleshy-stemmed kinds, such as *B. manicata*, and the tuberous-rooted with short succulent annual stems or no stems at all. In *B. prismatocarpa*, a tiny species from Fernando Po, we have a plant with the habit of a *Viola* in its thin creeping stems and small toothed leaves.

The variety in the size and form of the foliage is quite extreme. The peltate form is represented by the Lotus-leaved *B. nelumbæfolia* and the remarkable *B. socotrana*, the lance-shaped by *B. primulæfolia*, and the cut-leaved by *B. aspleniifolia*, a native of tropical Africa, with Fern-like foliage. *B. verticillata* has the leaves in whorls, *B. prolifera* produces its flower-scapes from the sinus in the leaf-blade, and so on. In leaf-coloration there are many noteworthy cases, of which the beautiful markings of *B. Rex* are familiar to everyone. The prettily spotted forms of *B. maculata*, the sanguineous red of *B. sanguinea*, and

the beautiful metallic purples of the varieties of *B. incarnata*, all of which are represented among the plants exhibited to-day, are attractive characters quite worth the notice of horticulture.

In the flowers we have the unmistakable stamp of the Begonia, yet at the same time plenty of variety. Size need not be touched upon, but in form there are the two-petalled, the ten-petalled, the drooping, the erect, the nodding; then, whilst in substance some are thick and succulent, others are thin and papery. In lasting qualities they vary too, some, such as *B. socotrana* and *B. Haageana*, holding on for several weeks, whilst others remain only for a day or two. The value of the former character in Begonias for the garden cannot be overrated. Species which hold their flowers well and are showy, or are even promising as breeders, should receive special attention from those interested in the improvement of the Begonia.

Then there is the character of fragrance, which, although not general in Begonias, is yet possessed by a few. *B. Baumannii*, a species lately noticed in the horticultural papers, I have not yet seen; but I know one, which was introduced to Kew from South China a few years ago, and figured in the *Bot. Mag.* (t. 6926) under the name of *B. cyclophylla*, which ought to prove a gold-mine to Mr. Laing or Mr. Cannell or M. Lemoine. It is tuberous-rooted, has an ornamental leaf and good-sized flesh-tinted flowers as powerfully fragrant as Roses. From what I know of this plant, it is not unlikely to cross with the tuberous-rooted kinds, or with the *socotrana* section.

So far the genus as a whole. There are a considerable number of species, known at present only in herbaria, but which are well worth introducing. At the same time it must be admitted that many of the species, probably four-fifths of them, are scarcely worth a place in the garden.

I have been through the Kew plants, both living and dried, have looked at all the pictures, and looked up pretty much all the literature of the cultivated Begonias, and I can only find fifty species among them which are in my opinion worth including among good garden-plants. These fifty I have described here. They are all in cultivation, I believe; most of them are grown at Kew, where also there are many others of comparatively little value as decorative plants. The Kew collection is rich in

number of species, comprising altogether 108 species, besides numerous hybrids and varieties. There is also a good collection cultivated in the Botanic Gardens at Berlin. Specialists interested in Begonias other than the tuberous-rooted are Messrs. Haage & Schmidt of Erfurt, M. Lemoine of Nancy, M. Bruant of Poitiers, and Mr. Gumbleton of Cork. I am certain that if some of the amateur horticulturists in this country would turn their attention to the shrubby Begonias, select and grow the best kinds, and breed from them with a view to their improvement, they would find both interest and profit in them. What little has been done in recent years to improve the evergreen kinds we owe to Continental growers. The forms of *B. semperflorens* and hybrids raised from it and others are good work, indicating, however, only slightly what might be done.

The history of the Begonia in the garden is not an eventful one. The first to be cultivated here was *B. nitida*, which was sent to Kew from Jamaica by Dr. W. Brown in 1777. In October 1788 a Begonia flowered in Mr. Lee's nursery at Hammersmith, and this is said to have led to a study of the genus by Dr. Dryander, whose researches were published in the following year in the Transactions of the Linnean Society. He enumerated twenty-three species, all that were known at that time. According to Aiton's "Hortus Kewensis," only seven species were known in gardens in 1813. These were *B. acuminata*, *B. dichotoma*, *B. discolor* (*Evansiana*), *B. hirsuta*, *B. humilis*, *B. macrophylla*, and *B. nitida*. These are all American except *B. discolor*, which is Chinese. Up to 1850 the number of species that had been in cultivation was thirty-six, and of these sixteen are included in the selection I have made from those known in gardens to-day.

The popularity of the Begonia as a garden flower did not really begin until 1864, when *B. boliviensis* was introduced by Messrs. Veitch from the Andes of South America. This was followed by five others, the last, *B. Davisii*, arriving in 1876. The important part these plants have played will be shown in the papers by Messrs. Cannell and Laing, who have both done so much to improve and popularise this section of Begonias.

Second only to the Andean Begonias in interest to horticulture is the remarkable winter-flowering *B. socotrana*, which was sent to Kew from Socotra by Professor Bayley Balfour in 1880

and afterwards became the property of Messrs. J. Veitch & Sons. The beautiful and extremely valuable hybrids obtained by Messrs. Veitch by crossing this species with the Andean tuberous-rooted kinds are another addition to the many successes in hybridisation achieved by them. How important a part *B. socotrana* is destined to play in the production of new races of Begonias it would not be easy to say. It has crossed freely with the tuberous-rooted kinds, and we have seedlings at Kew raised from it crossed with *B. geranioides*, and others which combine it and *B. Fræbeli*. The great desideratum now in the way of a Begonia is a plant or race which will combine the evergreen shrubby habit of the one section with the large flowers, beautiful colours, and the other good qualities of the tuberous-rooted kinds. No one has had any success in that direction yet, and it may be that a direct cross between the two cannot be obtained. There may, however, be other ways than the direct one. By paying attention to the characters of the genus generally, and crossing those species which are nearly affined, the breeder may ultimately succeed in so mixing up and fusing together the various characters of the genus as to win at the same time the anathema of the botanists of the old school and the eternal gratitude of the horticulturists of to-day and of all time. I am disposed to believe that the cross-breeding of plants will develop into a science which, instead of depending as it does to a large extent now on haphazard shots, will work upon scientific lines. Cross-breeding among plants is at the present time receiving attention from horticulturists of every description, from the beginner who tries to get a scented Dahlia by dusting it with Rose pollen to the skilful worker who produces a hybrid between two Cattleyas, or a new race of Gladioli. If anyone wishes to gauge the value of such work he cannot do better than compare the beautiful, wonderful Begonias here to-day with those six species from which in the course of twenty years they have been developed by the horticulturist.

May I be allowed to make one suggestion to those who breed from species or contemplate doing so? The names of the parents of every true hybrid should be recorded at the time the cross is made, and if the progeny is too good to destroy, then it should be described and its parentage set down in some horticultural periodical.

THE BEST FIFTY SPECIES OF BEGONIA.

B. albo-coccinea (Bot. Mag. t. 4172).—Introduced from Brazil to Kew in 1845. Rootstock a short creeping rhizome, from which spring numerous peltate, ovate, leathery green leaves 6 inches long, on petioles of the same length. Peduncles a foot or more long, coral-red, branched into a lax panicle. Male flowers of four petals 1 inch across; female flowers also of four petals. Capsule green, $\frac{1}{2}$ inch long, with three short winged angles. Intermediate; winter-flowering.

B. albo-picta (Bull's Catalogue, 1885).—Introduced from Brazil in 1885 by Mr. W. Bull. A shrubby evergreen plant of compact growth, freely branched, with elliptic, lanceolate, short-stalked leaves, 2 inches long, glossy green spotted with silvery white. I have not seen the flowers. Although the description suggests *B. maculata*, yet the plant is quite distinct from that species. It is an elegant little stove foliage plant.

B. Baumannii (Gartenflora, t. 1348).—Introduced from Bolivia by Herr Baumann in 1886; distributed by M. Lemoine in 1890. Tubers large as ostrich eggs. Leaves large, orbicular, with short, thick petioles. Peduncles 18 inches high, bearing panicles of four to six flowers, which are rose-red, 4-petalled, from 3 inches to 4 inches across, and fragrant as Roses. The plant is said to be of easy culture, and to be in flower nine months in the year. It is described as plentiful in the moist valleys of the Cordilleras, where it is eaten by cattle.

B. boliviensis, DC. (Bot. Mag. t. 5657).—Introduced from Bolivia in 1867 by Messrs. J. Veitch & Sons. Rootstock tuberous. Stems annual, 2 feet to 3 feet high, green. Leaves short-stalked, lanceolate, unequal at the base, 5 inches long, biserrate, green margined with red. Flowers drooping, bright scarlet, usually in pairs, one male, one female, on a short axillary peduncle; males 2 inches long, with lanceolate petals, stamens united in a long conical column; female shorter; ovary triangular, with two short and one long pointed wing. *B. Worthiana* is a seedling variety of this.

B. cinnabarina (Bot. Mag. t. 4483).—Introduced from Bolivia by Messrs. E. G. Henderson & Son in 1849. Root-

* I have quoted a good figure of nearly every species, preferably one in the *Botanical Magazine*.

stock tuberous. Stems annual, short, green, zigzag, slightly downy. Leaves on short petioles, obliquely ovate, lobed and serrate, 4 inches to 7 inches long, green, red-edged when young. Peduncles erect, 9 inches to 12 inches, bright red, bearing a compact panicle of cinnabar-red flowers 2 inches across. Male flowers with four, females with five petals; ovary triangular with one long and two short wings. Greenhouse.

B. Clarkei (Bot. Mag. t. 5675).—Introduced from Bolivia by Messrs. E. G. Henderson & Son, although at first stated to be from Peru. Rootstock tuberous. Stems and leaves as in *B. cinnabarina*, but more robust. Peduncles green, bearing few (usually only two) flowers, which are like those of *B. cinnabarina*, but rosy red in colour. Flowered by Col. T. Clarke in 1867. Greenhouse.

B. coccinea (Bot. Mag. t. 3990).—Introduced from Brazil by Messrs. J. Veitch & Sons in 1841. A beautiful plant, having tall, succulent, bamboo-like branching stems, 6 feet or more in height. Leaves green, on short petioles, obliquely oblong, angular, with wavy, red margins, 4 inches to 6 inches long. Peduncles axillary, branched, drooping, bearing numerous deep coral-red flowers; males $\frac{1}{2}$ inch across, of four unequal petals; females most attractive owing to the length and rich colour of the ovary, which has three small subequal wings. The male and female flowers are usually upon separate peduncles. This is a grand plant when properly grown. It likes a sunny position in a warm, moist house, where it should be planted out. Its flowers are very persistent and exceedingly ornamental. In a pot, unless very liberally treated, it makes a poor specimen. In the warmer parts of France and Italy it is grown out of doors. It was discovered by Gardner in 1837, who described it as "a magnificent plant growing on rocks and sometimes on the stems of trees on the Organ Mountains in Brazil." Syns. *B. corallina*, *B. maculata* var. *corallina*.

B. crinita (Bot. Mag. t. 5897).—Introduced from Bolivia by Messrs. Veitch & Sons in 1866. Rootstock tuberous, with fleshy, hairy, red stems a foot high, and ovate, cordate, irregularly toothed leaves, 2 inches to 5 inches long, green, tinged with red on the under side. Peduncles erect, dichotomous, red, producing three pale rose-coloured flowers, two female, one male; males $1\frac{1}{2}$ inch across, with two broad and two narrow petals; females with five

equal petals; ovary 3-angled, with two short and one long wing. Greenhouse.

B. cyclophylla (Bot. Mag. t. 6926).—Introduced from South China to Kew in 1885. Rootstock tuberous. Stem none. Leaves orbicular, 6 inches across, green, with fimbriated margin. Peduncles erect, 6 inches long. Flowers in a cyme, numerous, 1 inch across, rose-coloured, with a strong Rose-like odour. This plant flowered at Kew in a stove in April.

B. Davisii (Bot. Mag. t. 6252).—Introduced from Peru by Messrs. J. Veitch & Sons in 1876. Rootstock tuberous. Leaves all radical, spreading; petiole hairy, 3 inches long; blade obliquely cordate, crenulate, 4 inches long, deep glossy green above, crimson on the under side. Peduncles erect, 6 inches long, red, usually bearing three bright crimson flowers, two females, one male; males 2 inches across, formed of four equal petals; females half as large, 5-petalled; ovary 3-angled, with one long and two short wings. This has proved one of the most valuable in the breeding of the tuberous-rooted section, owing to its robust habit, fine green leaves, and sturdy erect flower-stalks.

B. decora.—This is a new introduction from Perak which we owe to Messrs. J. Veitch & Sons, who exhibited plants of it at the Begonia Conference under the erroneous name of *B. barbata*. I am indebted to Dr. Stapf, of Kew, for the following description, from one prepared by him for the *Gardeners' Chronicle*. Stem short, herbaceous, hairy, branched. Leaves hairy, obliquely ovate, 4 inches to 5 inches long, the margins denticulate on petioles 4 inches long; they are coloured rich coppery bronze, with lines of yellow along the principal nerves. The flowers are inconspicuous. This plant is certain to become a favourite in gardens, because of the ornamental colours of its foliage. As a species it is related to *B. barbata* and *B. Griffithii*. It has been awarded a First-class Certificate.

B. Evansiana (Bot. Mag. t. 1473).—Introduced from China to Kew in 1804. Rootstock tuberous. Stem annual, erect, fleshy, 2 feet to 3 feet high, smooth, branched, red. Leaves orbicular, cordate, acuminate, serrated, green with red tinted veins and covered with red hairs. Peduncles axillary, with drooping cymes of large handsome rose-coloured flowers; males $1\frac{1}{2}$ inch across, with four unequal petals; females with two broad petals and a

3-winged ovary, coloured like the petals. A useful plant for the cold house ; said to be hardy in some parts of England. It produces bulbils freely in the axils of the leaves. It flowers all through the summer. Has anyone ever tried to cross this with the Andean tuberous-rooted kinds ?

B. foliosa (Ref. Bot. 222).—Introduced from New Granada by Wilson Saunders in 1868. Shrubby. Stems herbaceous, slender, branching ; the branches arranged frond-like along the stem. Leaves very numerous, small, 3-lobed, glossy green. Flowers small, in short terminal and axillary panicles, white tinged with rose. An elegant basket plant, its frond-like stems and rich green foliage ornamented with the tassel-like racemes of flowers being pretty. It blooms in early summer.

B. Fræbeli (*The Garden*, 1877, pl. 94).—Introduced from Ecuador by Otto Fræbel, of Zurich, in 1872. Rootstock tuberous. Leaves radical, annual ; petioles 3 inches long, reddish, hairy ; blades obliquely cordate, 6 inches to 12 inches long, by from 3 inches to 8 inches wide, grey-green, hairy on both sides. Flowers on erect red peduncles a foot long, vivid crimson ; males 2 inches across, formed of four ovate petals ; females smaller, with five equal petals ; ovary woolly, 3-angled, wings $\frac{1}{4}$ inch long. A pretty little plant which may be used for summer bedding. It is also good as a winter-flowering plant for the warm greenhouse. Mr. Gumbleton grew it with a leaf 15 inches by 11 inches, and a flower-head of twenty-two flowers.

B. fuchsiioides (*Bot. Mag.* t. 4281).—Introduced from New Granada to Kew in 1847 by the collector Purdie, who found it on the Ocana Mountains. It has a woody rootstock, succulent tall stems a yard or more high, clothed with numerous ovate green leaves $1\frac{1}{2}$ inch long, tinged with red when young. The flowers are borne on drooping branched panicles ; males with four concave petals, females with five regular petals and a 3-angled unequal winged ovary ; colour of whole inflorescence a rich scarlet. This is a first-class greenhouse plant. It should be planted out, and its stems trained up a pillar or tall stake. A variety called *B. miniata* differs only in having flesh-coloured flowers.

B. gracilis (*Bot. Mag.* t. 2966).—Introduced from Mexico in 1829 by Mr. P. Neil, of Cannonmills, Edinburgh. Rootstock tuberous. Stems annual, erect, sparsely branched, 2 feet to 3 feet

high. Leaves pale green, orbicular or lanceolate, lobed, very succulent, variable in size. Peduncles axillary, bearing several large rosy-red flowers; males with two large roundish serrated petals and two smaller inner ones; females small, with a green 3-angled ovary. A common plant in some parts of Mexico. It has various synonyms, and there are no less than seven varieties of it named. It is a pretty plant for the greenhouse when well grown. I have seen hybrids between it and the common tuberous-rooted kinds. It is remarkable in its habit of developing great numbers of small bulbilæ in its leaf axils, and even in the axils of the pedicels. Other names for it are *B. diversifolia* and *B. Martiana*. *B. bicolor* of Sereno Watson is apparently this plant.

B. geranioides (*Bot. Mag.* t. 5583).—Introduced from Natal to Kew in 1866. Rootstock tuberous. Leaves radical, reniform, 6 inches across, lobed and toothed, green, hairy; leaf-stalks 8 inches long. Peduncles erect, 6 inches to 12 inches long, reddish, hairy, bearing a lax drooping panicle of flowers each $1\frac{1}{4}$ inch across, pure white with a button-like cluster of yellow anthers; females 5-petalled, with a white 3-winged ovary. Planted in a border in a sunny greenhouse this is a really charming Begonia, flowering most profusely from the beginning of October till the end of November.

B. glaucophylla (*Bot. Mag.* t. 7219).—This plant had been in cultivation at least ten years in England prior to its being described in the *Botanical Magazine* this year. It is probably Brazilian. Stems long, drooping or creeping, perennial, bearing short-stalked, ovate, wavy leaves 3 inches to 5 inches long, and glaucous green. Flowers in compact axillary clusters, on short peduncles, rose-red, variegated in bud; males 1 inch across, with two ovate and two linear petals; females with four equal petals and a large 3-winged ovary. A first-rate basket plant, flowering freely all through the winter. It is also called *B. glaucophylla splendens*, *B. Limminghei*, and Comte de Limminghe.

B. gogoensis.—Introduced from Gogoe, in Sumatra, by Messrs. J. Veitch & Sons in 1882, and described by Mr. Brown in *Gard. Chron.* 1882, July, p. 71. It has a short tuberous stem as in *B. Rex*, reddish erect 4-angled petioles 6 inches long; blades oval, 6 inches to 9 inches long, bullate, green with dark bronzy blotches, the nerves paler, under side coloured deep red. Flowers small,

rosy pink, on erect peduncles as long as the leaf-stalks. A distinct and ornamental-leaved stove plant.

B. Griffithii (*Bot. Mag.* t. 4984).—Introduced from Assam by Messrs. E. H. Henderson in 1856. Stem, leaves, and habit as in *B. Rex*, with which it has no doubt been crossed by breeders of the ornamental-leaved Begonias. Its leaves are coloured olive-green with a broad zone of grey tinged with red on the under side. The flowers are large, fleshy, pink, and the winged ovary is curiously crinkled along the angles.

B. Haageana (*Bot. Mag.* t. 7028, as *B. Scharffii*).—Introduced from Brazil in 1887 by Messrs. Haage & Schmidt, of Erfurt. A tall shrubby plant, specimens at Kew having formed dense bushes 6 feet high and 3 feet through. Whole plant hairy. Leaves obliquely ovate-cordate, acuminate, wavy, a foot or more long, dark green above with reddish nerves, crimson on the under side. Peduncles axillary, a foot long, branched above into an enormous cyme, 8 inches to 12 inches in diameter, crowded with flowers; males and females generally on separate peduncles, the former $2\frac{1}{2}$ inches across, with two large orbicular petals and two very narrow ones, white; females smaller, with five equal petals and a short 3-angled ovary, with long subequal wings. The peduncles, pedicels, ovaries, and under sides of the petals are covered with long red hairs. This is certainly one of the most beautiful plants in the genus. It forms a grand specimen, blooms all the year round, and its large flowers remain upon the plants several weeks. It has been distributed under the name of *B. Scharffiana* through a mistake. It is a near ally of *B. metallica* and *B. echinosepala*, and has already been crossed with both these species.

B. heracleifolia (*Bot. Mag.* tt. 3444, 4983).—Introduced from Mexico by Herr Otto, of Berlin, about 1830. Stem a short thick rhizome, bearing erect, stout, fleshy, hairy leaf-stalks 10 inches to 18 inches long, tinged with red; blades 6 inches to 12 inches across, palmate, with toothed lobes, rich green. Peduncles a yard or more high, hairy, bearing branching panicles of white rose-tinted flowers; males with two ovate petals; females also dipetalous, ovary 3-angled, with one long wing. Syns. *B. jatrophaefolia*, *B. punctata*, *B. radiata*. Var. *nigricans* has leaves banded with very dark green. Var. *longipila* has long fleshy hairs on the leaf-stalks and peduncles. This is a handsome

foliage plant, and is also worth growing for the sake of its tall scapes of white flowers, developed in winter.

B. imperialis (*Illus. Hort.* 1861, t. 2764).—Introduced from Mexico by Verschaffelt in 1859. Stem short, herbaceous, green. Leaves on hairy petioles, 4 inches to 6 inches long; blades broadly cordate, 4 inches to 6 inches wide, very hairy, brown, with irregular bands of bright green along the nerves. Peduncles erect, 3 inches long, bearing a cluster of white flowers and green bracts. Flowers with two ovate petals; ovary broad, 3-angled, green, with one long wing. The variety *maculata* has brown leaves with green blotches, and the variety *smaragdina* has wholly green leaves. Grown only for its foliage.

B. incarnata (*Bot. Mag.* t. 2900, as *B. insignis*).—Introduced from Mexico to the Berlin Botanic Gardens in 1822. Stem erect, herbaceous, perennial, about 2 feet high. Leaves unequally cordate, lanceolate, toothed, green above, reddish beneath. Flowers on arching peduncles, rose-coloured; males $1\frac{1}{2}$ inch across, with two ovate and two narrow petals; females smaller, with five equal petals; ovary 3-angled, wings unequal. This is a very variable species, and includes a number of named kinds, viz. *acuminata*, *aucubæfolia*, *papillosa*, *Lindleyana*, *maculosa*, *metallica*, and *purpurea*. The last named is probably the parent of the bronzy crimson-leaved kinds named Arthur Mallet, M. Hardy, Madame Lionel, and several others. These are known as *Rex-subpeltata* hybrids. The first, viz. A. Mallet, was raised in the gardens of M. Arthur Mallet, of Jouy in Josas, in 1886, the parentage being given as *B. subpeltata* and *B. Eldorado*, neither plant known to me. A comparison of these supposed hybrids with the purple-leaved variety of *B. incarnata*, all of which are among the Kew exhibits here to-day, will, I think, satisfy anyone as to their very near relationship. I am informed that in some parts of France these varieties of *B. incarnata* are employed for summer bedding.

B. Kunthiana (*Bot. Mag.* t. 5284).—Introduced from Venezuela to Berlin in 1858. Stems slender, 12 inches to 18 inches high, perennial, with swollen nodes. Leaves on short stalks, semi-erect, lanceolate, 3 inches long, serrate, dark green above, blood-crimson beneath. Flowers white, in pairs or threes on short peduncles; males $1\frac{1}{2}$ inch across, with two large and two small petals; females with five equal petals; ovary 3-angled,

with large subequal wings. A pretty little plant for the warm greenhouse.

B. laciniata (Bot. Mag. t. 5021).—Introduced from India to Kew in 1857. Stem perennial, 1 to 2 feet high, tomentose. Leaves roundly ovate, lobed, pubescent, 6 inches across, black-purple with a broad zone of green, reddish on the under side. Flowers as in *B. Rex*, both in form and colour; ovary pubescent, large, 3-angled. An ornamental-leaved plant of the *Rex* type. It is common in India, and is found also in South China. Var. *Bowringiana* (Bot. Mag. t. 5182) has green leaves and rosy flowers.

B. Lubbersii (Gard. Chron. 1888, vol. iii. p. 301, fig.).—Introduced from Brazil in 1883 into the Brussels Botanic Gardens. Stem erect, a foot high. Petioles 2 inches long; leaf-blades peltate, obliquely lanceolate, bright green with blotches of white, crimson on the under side. Flowers on short axillary peduncles, $1\frac{1}{2}$ inch across, white; males of two broad and two rudimentary petals, females much smaller. This is a distinct and pretty leaved plant, but it has failed to win much favour owing to its bad behaviour under cultivation.

B. Lynchiana (Bot. Mag. t. 6758).—Introduced from Colombia (not Mexico as stated) about 1877 by M. Roezl, who sent it to M. Benary, of Erfurt. It was distributed under the name of *B. Roezlii*, but as there was already a *Begonia* of that name, Sir Joseph Hooker renamed it in compliment to Mr. Lynch, the Curator at Cambridge, who had been the means of its becoming known in England. Rootstock woody. Stems succulent, 3 feet high, smooth, green. Leaves on short petioles, ovate or reniform, unequally cordate, toothed at the margins, 6 inches to 8 inches across, bright green with a spot of red at the base of the sinus, tinged with red on under side. Peduncles axillary, stout, 6 inches to 10 inches long, bearing large panicles (6 inches to 8 inches in diameter) of bright scarlet large flowers; males with two ovate petals $\frac{3}{4}$ inch across, females with two to four petals; ovary 3-4 angled; wings broad, rounded. A magnificent *Begonia*, specially valuable owing to its flowering in winter. Mr. Lynch says the stems must not be stopped, or weak shoots will result. The plants flower from October to May. I believe the large perpetual-flowering forms of *B. semperflorens*.

so called, have really been the outcome of crossing *B. Lynchiana* with *B. semperflorens*.

B. maculata (Bot. Reg. t. 666).—Introduced from Brazil about 1822. Stem erect, branched, 2 feet to 3 feet high, smooth, woody when old. Leaves obliquely cordate, lanceolate, wavy, 4 inches to 6 inches long, green with white roundish spots, the margin and under surface crimson. Peduncles axillary, drooping, many-flowered. Flowers pale rose or white; females much more numerous than males, the latter $\frac{1}{2}$ inch across, and formed of two rotund and two very narrow petals; females of five equal petals; ovary $\frac{2}{3}$ inch long, with broad subequal wings. A stove plant, of which there are several forms, viz. *argyrostigma*, *Wightii*, &c.

B. manicata (Mart. Fl. Bras. vol. iv. t. 101).—Introduced from Mexico in 1842. A short-stemmed succulent species with long-stalked leaves, the stalks clothed with fleshy, scale-like hairs; blade ovate, obliquely cordate, smooth shining green, 6 inches to 8 inches long. Peduncles a foot or more long, bearing loose panicles of pink dipetalous flowers. Ovary 3-angled, wings nearly equal. A useful winter-flowering stove plant. There is a variety of it, *aureo-maculata*, with large blotches of bright yellow on the leaves.

B. metallica (Gard. Chron. 1876, vol. v. p. 397).—Introduced from Bahia in 1869 by Wilson Saunders. Stems perennial, succulent, hairy, 4 feet to 6 feet high, branched. Leaves very numerous, obliquely cordate, lobed and serrated, 3 inches to 6 inches long, hairy, green shaded with a darker metallic colour. Flowers in axillary peduncles, crowded, bluish white; males 1 inch across, with two rounded and two very narrow petals; females much smaller, with five regular petals; ovary and back of petals clothed with red bristly hairs. A useful plant for the conservatory, easily grown, and decorative both in foliage and flower.

B. natalensis (Bot. Mag. 4841).—Introduced from Natal to Kew in 1854. Rootstock a large fleshy tuber. Stems fleshy, annual, 1 foot to 2 feet high. Leaves obliquely cordate, lobed, sinuate, 2 inches to 3 inches long, green, sometimes mottled with grey, veins reddish. Flowers numerous on slender axillary peduncles, bluish white, 1 inch across; males with two ovate petals, females with five equal petals; ovary 3-angled; two long, one short wing. An easily grown free-flowering greenhouse plant.

B. nitida (Bot. Mag. t. 4046).—Introduced from Jamaica to Kew in 1777. Stems 3 feet to 4 feet high, perennial, fleshy, woody at the base. Leaves large, glossy green, obliquely ovate, wavy, 4 inches to 6 inches across. Flowers crowded on long axillary peduncles, pale pink; males $1\frac{1}{2}$ inch across, with two broad and two narrow petals; females smaller, with five equal petals; ovary 3-angled, with two small and one large wing. A good useful summer-flowering plant for the stove or warm greenhouse. Interesting as being the first Begonia introduced into Europe.

B. octopetala (Bot. Mag. t. 3559).—Introduced from Lima in Brazil to the Glasgow Botanic Gardens in 1835. Rootstock tuberous. Leaves radical, on stout, fleshy, downy petioles, 12 inches to 18 inches long; blade cordate, 8 inches long, lobed, toothed, green. Peduncle erect, 1 foot to 2 feet long, bearing corymbs of from six to twenty large ivory-white flowers, not unlike those of *Anemone japonica*; males 2 inches to 3 inches across, with from six to ten ovate spreading petals; females smaller, with six petals; ovary turbinate, 3-angled; one wing $\frac{1}{2}$ inch long. A winter or autumn flowering plant, which thrives best in a cool house or frame. It is said to grow in shady places in the crevices of rocks. It has been crossed with the popular tuberous-rooted kinds by Lemoine.

B. Pearcei (Bot. Mag. t. 5545).—Introduced from La Paz by Messrs. J. Veitch & Sons in 1865. Rootstock tuberous. Stem fleshy, annual, short, pubescent. Leaves obliquely ovate, acuminate, toothed, 4 inches to 6 inches long, dark green, paler along the veins, dull red beneath. Flowers in axillary, erect peduncles, yellow, $1\frac{1}{2}$ inch across; males with two round and two ovate petals; females smaller, with five equal petals; ovary green, 3-angled; wings nearly equal. One of the species from which many of the best yellow and white flowered tuberous-rooted kinds have been bred.

B. peltata.—Introduced from Brazil in 1815. Stem perennial, thick, succulent, covered with a soft tomentum, as also are the leaves and petioles. Leaves peltate, ovate, acuminate, thick and succulent, whitish, 6 inches to 9 inches long. Peduncles long, erect; cymes branched, bearing numerous small white flowers in winter. Interesting on account of its thick felted peltate silvery leaves. It is worth growing as a stove foliage plant. *B. auriformis* is apparently the same as or very near this species, which has also borne the names *coriacea*, *peltifolia*, and *Hasskarlii*.

B. phyllomaniaca (*Bot. Mag.* t. 5254).—Introduced from Brazil in 1851. Stem perennial, succulent, green, hairy, rarely branched. Leaves obliquely cordate, attenuate, 4 inches to 8 inches long, slightly lacinated and fringed. Flowers in axillary peduncles, drooping, an inch across, females much larger than males, pale pink. This species is peculiar in that it produces from the stem and petioles innumerable leaflets or small growths, which on being detached and placed on moist ground produce roots and perfect plants. It is one of the most interesting of plants, though not of much decorative value.

B. polypetala (*The Garden*, 1878, t. 531).—Introduced from Northern Peru by Messrs. Frœbel in 1878. Rootstock tuberous. Stems short, fleshy, annual. Leaves ovate, cordate, toothed, hairy, with raised veins, 10 inches by 8 inches; stalk as long as the blade. Flower-scape erect, a foot or more long; flowers with nine or ten ovate-oblong petals an inch long, red; ovary hairy, with one long wing. This is a beautiful plant, but difficult to cultivate. It blooms in winter, starting into growth in August. It requires warm greenhouse treatment. The flowers have been compared to those of *Anenome fulgens*.

B. Rex (*Bot. Mag.* t. 1101).—Introduced by Mr. J. Linden from Assam in 1858. Rootstock a short fleshy rhizome, from which spring the long-stalked, large, ovate, wavy leaves, which are bullate, hairy, and coloured rich metallic green with a zone of silvery grey. Peduncles erect, as long as the leaf-stalks, bearing dichotomous cymes of large rose-tinted flowers; males 2 inches across, with four unequal petals; females smaller, with five nearly equal petals; ovary 3-angled, with two short and one long wing. When this was introduced Sir J. Hooker described it as "certainly the most lovely of the many lovely species of *Begonia* with which we are acquainted." I was informed by Mr. Linden's manager that of all the plants introduced by Mr. Linden this *Begonia* proved the most profitable. There are numerous varieties of it, and it has been hybridised with *B. discolor* and *B. diadema*. Although a stove plant, it may be grown in the ordinary greenhouse or conservatory, where it is useful for planting in shaded corners. Back walls in plant-houses, if netted with wire and lined with peat and moss, may be completely covered with the varieties of *B. Rex*.

B. rosæflora (*Bot. Mag.* t. 5680).—Introduced from Peru by

Messrs. J. Veitch & Sons in 1867. A near ally of *B. Veitchii* and *B. Clarkei*. It is stemless, with leaves on fleshy, decumbent, reddish, hairy petioles; the blade reniform, lobulate, green edged with red. Peduncles stout, hairy, 4 inches to 6 inches long, usually 3-flowered; males 2 inches in diameter, 4-petalled, full, rich rose-red; females smaller, with five equal petals; ovary hairy, with short wings.

B. rubricaulis (Bot. Mag. t. 4131).—Introduced to the Birmingham Botanic Garden in 1844; country unknown, probably American. Rootstock tuberous. Petioles 4 inches to 6 inches long, fleshy, hairy, crimson; leaf-blade ovate, 4 inches to 6 inches, wavy, ciliated along the margins, deep green. Scape, 12 inches to 18 inches high, crimson and hairy like the leaf-stalks, bearing a branched panicle of large handsome flowers; males $1\frac{1}{2}$ inch across, with five equal concave red-tinted petals; females smaller, with six equal petals; ovary with two very short wings, the third $\frac{1}{2}$ inch long.

B. sanguinea (Bot. Mag. t. 3520).—Introduced from Rio de Janeiro in 1823 to the Berlin Botanic Garden. Stems perennial, woody at the base, red. Leaves subpeltate, obliquely cordate, thick, fleshy, shining, bright green above, blood-crimson below. Peduncle a foot long, red, bearing a dichotomous cyme of small white flowers; males with four unequal, females with five subequal petals; ovary 3-angled, green. A handsome evergreen foliage Begonia, worthy of a place in all large collections of stove plants. It flowers in April.

B. Schmidtii (Gartenflora, 1879, t. 990).—Introduced from Brazil in 1878 by Messrs. Haage & Schmidt. A dwarf herbaceous plant, never exceeding a foot in height, with obliquely lobed, toothed, hairy green leaves, reddish underneath. Flowers numerous, on short axillary peduncles, white tinted with rose, $\frac{2}{3}$ inch across; males with four, females with five unequal petals; ovary 3-angled, equal winged. A free-flowering little plant, useful for summer bedding. It has been crossed with several other species.

B. semperflorens (Bot. Mag. t. 2920).—Introduced from Brazil in 1828 to the Liverpool Botanic Garden. It is a variable plant, the form represented in the *Botanical Magazine* being one of the poorest. The plant is probably annual when wild. Stems herbaceous, smooth, green or reddish, 6 inches to

18 inches high. Leaves ovate, rotundate, obtuse at the base, toothed and ciliated along the margin, pale glossy green, tinged with red on the midrib and petiole. Peduncles axillary, few flowered. Flowers white or rose-coloured, the males with four, the females with five unequal petals. Ovary green with red-tinged wings. There are numerous named varieties and garden forms of this species. Some, such as that known as *gigantea*, is no doubt a hybrid between *B. semperflorens* and another, probably *B. Lynchiana*. Some of the varieties have variegated flowers, others being remarkable for the deep bronzy purple colour assumed by their foliage when grown in the open air. *B. cucullata* and *B. spathulata* are other names for this species. It will be seen from the list of hybrids that *B. semperflorens* has been crossed frequently with other species. The variety *gigantea* is one of the very best greenhouse plants we have.

B. socotrana (*Bot. Mag.* t. 6555).—Introduced from the island of Socotra in 1880, when it was sent to Kew by Professor Bayley Balfour. Rootstock perennial, formed of numerous fleshy buds clustered and resembling a tuber. Stems annual, slender, 6 inches to 12 inches long. Leaves orbicular, peltate, 4 inches to 10 inches across, bright green; petioles 3 inches long. Flowers numerous, on erect, slender axillary peduncles; males 2 inches across, with five subequal concave petals coloured bright rose; females with five or six equal petals; ovary green, 3-angled with one long wing. A pretty and interesting species, valuable on account of its habit of flowering in midwinter, and also in its peculiar character of holding its flowers till they wither. It has been crossed with several other species by Messrs. Veitch, who have thus obtained some most valuable winter-flowering hybrids. M. Lemoine has also raised two excellent hybrids from it and *B. Lynchiana*, viz. *Triomphe de Lemoine* and *Triomphe de Nancy*.

B. scandens.—A West Indian species which has been in cultivation since 1874. It has the habit of Ivy, the stems growing to a length of several yards and clinging by means of short aerial roots. The leaves are ovate, acuminate, lobed, glossy green, 4 inches long. Flowers in axillary dichotomous panicles, small, white. Syns. *B. lucida*, *B. elliptica*, *B. Haageana*. This plant might be crossed with some such species as *B. coccinea* (*corallina*) or *B. fuchsoides*.

B. Scharffiana.—Introduced from Brazil in 1887 by Messrs.

Haage & Schmidt. A robust herbaceous perennial with very hairy stems and leaves, the latter large, thick and fleshy, olive-green above, crimson below; stipules very large. Flowers on stout drooping peduncle, like those of *B. Haageana*. This species resembles *B. Haageana* in every character except the above, and in its being a less floriferous plant. It has the peculiar habit of sometimes producing leaves as well as flowers on the peduncle. Although inferior to *B. Haageana*, it is nevertheless a good garden Begonia. A variety of it called *minor* has smaller leaves and is a much dwarfer plant. *B. Scharffiana* has been grown at Kew into a specimen a yard through, with leaves 10 inches wide.

B. Sutherlandii (*Bot. Mag.* t. 5689).—Introduced from Natal in 1867 by Messrs. J. Backhouse & Sons, York. Rootstock tuberous. Stems annual, herbaceous, 1 foot to 2 feet high, coloured bright red. Leaves with slender red petioles, 2 inches to 3 inches long; blade 4 inches to 6 inches long, lanceolate, lobed and serrated, green with red veins and margin. Flowers numerous, on slender red peduncles, males with four unequal, females with five equal petals; colour coppery or salmon-red. A pretty little plant that may be grown in a cool greenhouse all the year round, or out of doors in summer and stored in a shed in winter.

B. Thwaitesii (*Bot. Mag.* t. 4692).—Introduced from Ceylon in 1852 by Kew. Rootstock tuberous. Leaves all radical, with cordate blades 5 inches long on hairy petioles 3 inches long; colour coppery green mixed with purple and blotched with grey, covered with purple hairs, the under side crimson. Flowers white tinged with pink. This is chiefly interesting as a variegated leaved plant. It requires stove treatment. Messrs. Veitch obtained a First-class Certificate for it in 1885.

B. Veitchii (*Bot. Mag.* t. 5663).—Introduced from the Peruvian Andes in 1867 by Messrs. J. Veitch & Sons. It is similar to *B. Clarkei*, but is slightly less vigorous in habit and smaller in foliage, and it surpasses that species in the brilliancy of its flower-colour. Sir Joseph Hooker said of it: "Of all the species of Begonia known this is the finest. With the habit of *Saxifraga ciliata*, immense flowers of a vivid cinnabar-red, it adds the novel feature of being hardy in certain parts of England." After fifteen years' experience with it, we are bound to say that it cannot be called hardy anywhere in England. It is one of the progenitors of the race of tuberous-rooted Begonias.

B. xanthina (Bot. Mag. tt. 4683, 5102, 5107).—Introduced from Bhotan in 1852 by Nuttall. It is similar to *B. Rex*, probably only a form of that species. The leaves are large, fleshy, and richly variegated. Three varieties of it are represented in the *Botanical Magazine*. It has golden-yellow flowers.

HYBRIDS.

The following list comprises all the hybrid Begonias of which I have been able to find a record:—

Name of hybrid	Parents.	Raiser	Date
Abundance . . .	semperflorens and fuchsioides	Lemoine .	1891
Ameliæ . . .	Lynchiana and Bruantii .	Bruant .	1886
argenteo-guttata . . .	albo-picta and Olbia . .	Lemoine .	1889
ascotensis . . .		Standish .	1870
Autumn Rose . . .	socotrana and insignis .	Veitch .	1882
Bruantii . . .	semperflorens and Schmidtii	Bruant .	1883
Carrierei . . .	semperflorens and Schmidtii	Bruant .	1883
Corbeille de feu . . .	semperflorens and fuchsioides	Lemoine .	1891
Credneri . . .	Scharffiana and metallica .	Lemoine .	1891
Diadème . . .	semperflorens and Lynchiana	Lemoine .	1891
discolor × Rex . . .	discolor and Rex . . .	? Bruant .	?1878
Duchartrei . . .	echinosepala and Scharffiana	Bruant .	1892
Frœbeli vernalis . . .	Frœbeli and Dregei . . .	J. Deleuil	1880
Gloire de Sceaux . . .	socotrana and subpeltata .	Thibaut & Keteleer	1885
Ingramii . . .	nitida and fuchsioides .	Ingram .	1849
Illustration . . .	semperflorens var. and Lynchiana	Lemoine .	1891
John Heal . . .	socotrana and a tuberous var.	Veitch .	1885
Knowsleyana			
La France . . .	Schmidtii and semperflorens	Lemoine .	1891
Lemoinei . . .	octopetala and tuberous var.	Lemoine .	1888
Listeri . . .	heracleifolia and another .	Lister .	?1880
Lucianæ . . .	Lynchiana and Bruantii .	Bruant .	1889
Margaritæ . . .	echinosepala and incarnata	Bruant .	1884
Mira . . .	gogoensis and diadema .	Bruant .	1885
Novelty . . .	Davisii and lineata . . .	Veitch .	1882
Paul Bruant . . .	manicata and (?) . . .	Bruant .	1892
pictavensis . . .	Scharffiana and metallica .	Bruant .	1891
prestoniensis . . .	nitida and cinnabarina .		?1857
Rex-diadema . . .	Rex and diadema . . .	Bruant .	
Saundersii (Digswelliana)			
Sedeni . . .	boliviensis and rosæflora .	Veitch .	1869
semperflorens gigantea .	semperflorens and Lynchiana	Lemoine .	1888
Triomphe de Lemoine .	socotrana and Lynchiana .	Lemoine .	1888
Triomphe de Nancy . . .	socotrana and Lynchiana .	Lemoine .	1888
weltoniensis . . .			
Winter Gem . . .	socotrana and a tuberous var.	Veitch .	1891

TUBEROUS BEGONIAS.

By Mr. JOHN LAING, F.R.H.S.

THE origin of many old garden plants is involved in obscurity, and it is doubtful whether the account given of several of them is anything more than the merest supposition. This is not the case, however, with the garden race of tuberous Begonias. In no other class of plants has the improvement been so rapid or so extensive—a fact due, no doubt, to the diligence of hybridists, combined with the readiness with which the wild types lend themselves to hybridisation, and the progeny to cross-breeding. Six species have been utilised in the creation of the summer-flowering race, and the difference in the foliage of the parents, in the habit of the plants, and in the colour of the flowers, together with the new conditions created by cultivation, has enabled such rapid progress to be made. The number of seeds that a plant, or even a single pod, will yield enables the raiser to multiply Begonias at a greater rate, perhaps, than any other garden plant. Rarely is it given within a lifetime to accomplish such magnificent results as have been achieved. Twenty years ago no one could have predicted, and far less believed, what would have been accomplished in the time, judging, at least, from the first hybrids that were sent out ;

But facts are chieils that winna ding,
And downa be disputed.

All the varieties of Chinese Primulas, and of Carnations and Pinks, for example, have been raised in each case from a single species, and, consequently, the variation and selection of seedlings has been a slow process. Zonal Pelargoniums, on the other hand, furnish an example in which a vast number of garden varieties have been raised by the hybridisation of two or more species ; but as they produce comparatively few seeds, a long time has been required to achieve present results. A large proportion of Pelargonium seedlings, again, are useless for bedding purposes ; but the seedlings of a good strain of Begonias can always be depended on to make a good display, as the quality is relatively even. Therefore, with this facility for raising seedlings, only the most rigorous selection should be

made of varieties worthy of a name, and to be propagated by cuttings for pot culture.

B. boliviensis was the first species introduced; it was brought to this country in 1864. The characteristics of the plant are its narrow leaves and drooping, elongated, cinnabar-scarlet and Fuchsia-like flowers. A large number of my double varieties at one time showed the influence of this species by their narrow leaves and elongated, many-centred flowers. It was also the seed-parent of the first hybrid, *B. Sedeni*, sent out in 1870. Even now it is something more than a botanical curiosity.

The next species introduced was *B. Pearcei*, in 1865. It was the chief factor in the production of the yellow, buff, and orange-coloured varieties. Its broad, oblique, olive-green leaves, more or less ornamented with silvery or pale green veins, can be distinctly traced in a large number of the choice modern kinds.

B. Veitchi followed in 1867, characterised by its broad, orbicular leaves, and large round flowers of a brilliant vermilion. Many of the finest varieties, both single and double, now in existence owe their origin and their fine qualities to it.

In the same year *B. rosæflora* was brought home, and was utilised to a small extent only in the production of some of the earliest hybrids. Light-coloured seedlings of it gave rise to Queen of Whites, put into commerce in 1878, and destined to be a most important factor in subsequent varieties of the same colour. *B. rosæflora* has broad, orbicular leaves, and pale red flowers, like those of the Sweet Briar.

B. Davisi reached this country in 1876, and was much utilised, for a time at least, in the production of new kinds. Its neat dwarf habit, and warm scarlet flowers, carried well above the foliage, made it a favourite with hybridists. It gave rise to numerous dwarf, erect-habited kinds, with small but brightly coloured flowers.

B. Clarkei was introduced in the same year as *B. Veitchi* and *B. rosæflora*, but, like the latter, was not much used as a parent. It resembles *B. Veitchi* to some extent, and is of tall habit, with rose-red flowers. It was, moreover, the seed-parent of Vesuvius and Emperor, two important varieties which long held their own, either as pot plants or for bedding out.

Leaving out of consideration the race of winter-flowering

kinds, the present race has sprung from these six species ; but the first three are most in evidence to-day. The parents have been left so far behind that there is no occasion to use them further for improving the race ; and the types are in danger of being lost to cultivation, unless they be preserved by enthusiasts or others of a botanical turn of mind. The first five of the six species above named were introduced by Messrs. Veitch, who put them into commerce, together with some of the first noteworthy hybrids they had made, and they were thus the pioneers in the great work which was on the eve of taking the horticultural world by surprise. Other eager workers, both in this country and on the Continent, were soon in the field, helping forward the great movement at a more or less rapid pace.

I commenced hybridising and cross-breeding in 1875, with *B. boliviensis*, *B. Veitchi*, and *B. Pearcei*, together with the varieties Vesuvius, Dr. Hooker, Dr. Masters, and Mrs. Masters ; but

The best laid schemes o' mice and men
Gang aft agley,

and nothing very striking resulted in the following year. But as "sma' beginnins hae sometimes big endins," I set to work in earnest by obtaining the finest of continental as well as of home-raised seedlings, and was encouraged by considerably better results. In January 1878 I sowed seeds of fifty-seven different crosses, obtained by cross-breeding with the best sorts I could secure. The seedlings, when they flowered, foreshadowed possibilities I never dreamt of before, and I was awarded the Gold Medal of the Royal Horticultural Society for a group of seedlings, as well as some First-class Certificates. The astonished public also began to appreciate the "coming flower." That same year I secured Queen of Whites and Henderson's White Queen, and made numerous reciprocal crosses, from which, in 1879, I obtained 500 white-flowered seedlings ; the tall ones I assorted under the name of Reine Blanche, and the dwarf ones I named Stanstead Bride. The greatest improvement, Stanstead Rival, having orbicular flowers and erect flower-stems, came out of the same batch. Besides other fine types, a small-flowered, nearly black variety made its appearance, and was kept for breeding purposes. It is represented in such modern types as

Duke of Edinburgh and H. M. Stanley, with maroon-crimson flowers. By the autumn of that year I had made 161 different crosses of carefully selected parents, single and double, using Stanstead Rival, Reine Blanche, and Lady Hume Campbell, the first-named most extensively on account of its stiff upright habit.

Although it is interesting to know the first steps in the progress of development in this fine race of garden plants, the subsequent records of cross-breeding would be as futile to science as bewildering to anyone who might wish to trace the genealogy to the present time. Suffice it to say, the best types only were and are used as parents to sustain the onward march of progress. Size, shape, texture, and colour of the flowers, as well as the habit of the plant, were always kept in view. As far as size is concerned, the legitimate or desirable limit has been reached in the eight varieties named Royal Begonias sent out in 1886, particularly in Victoria, which has flowers measuring 7 inches across when well grown.

Singles.—The aim in this section is to get as many distinct and well-defined colours as possible, as well as an upright habit, with a profusion of flowers that do not require staking. Naturally the dwarf-habited and freely-branched sorts are the best parents to select from for the latter purpose. Some few there are, such as Leviathan, with stems like miniature hop-poles, but their admirers are few. The texture of the flowers has made wonderful strides within the last few years. Orbicular flowers, as round as the compass could make them, have always been the aim of the florist, and are well represented by Mrs. R. Ballantine, E. G. Hill, H. M. Stanley, Lady Scott, Fringed White, Lord Hillingdon, Lady Pigott, and others. These are some of last year's acquisitions, and Duchess of Leinster and Duchess of Westminster are also quite recent. The last-named is one of a white-centred race; and I am now working on a dark-centred strain, with promising results. Lady Whitehead bears six to eight large flowers in a truss and represents a floriferous type. I still believe that improvement is possible, after all my previous efforts; for

Wha does the utmost that he can,
Will whyles do mair.

Doubles.—Good double varieties are more difficult to obtain

than single ones, on account of the difficulty of getting pollen. The continental growers were the most successful with this section in the earliest stages of its development, but home-raised varieties are now far superior to the earlier types. My varieties of to-day show a marked improvement upon those of as recent a date as 1887. They were then globular, densely crowded with petals, lumpy and heavy, although better than the ragged and unshapely flowers of previous years. Those that obtained First-class Certificates five years ago would not now attract attention, far less merit approval. During the early days of the development of the flower we had to be content with size and colour, with little regard to either shape or refinement. One named Glow was a great acquisition in its day, being large, globular, and bright scarlet, but it consisted of numerous centres or secondary flowers resembling a truss of a double Pelargonium. Many of the largest-flowered varieties I have recently obtained have short, stout stalks, and are self-supporting, bearing their huge blooms erect without staking. My aim is now to select and perpetuate only varieties with broad, even petals, arranged round a common centre, and having the refinement of either the Rose, Camellia, or Picotee, or displaying the crimped petals of the double Hollyhock. The first is represented by Princess May, white; Lady Wantage, rosy-pink; Laing's Rosebud, blush-pink; W. Clifford, rose; Laing's Triumph, rosy-carmine; and Sir Trevor Lawrence, like a bunch of crimson Tea Roses when half expanded. The Camellia and Picotee types are represented by varieties bearing those names. A great many of the single-centred flowers may be compared to double Hollyhocks or Petunias, on account of their wavy, undulated, or crisped petals, and people appreciate these forms. They are well exemplified by Glory of Stanstead, white flushed pink; Lady Brooke, salmon-red; Duke of Fife, salmon; Lady Dorrington, blush-pink; and Baroness Burdett-Coutts, salmon-rose. The Duchess of Teck is like a bunch of Primroses. Various other comparisons might be made, but enough has been said to indicate the present lines on which double Begonias are being refined and improved, for the variation of colour seems endless.

Uses.—One of the most important uses to which Begonias can be put is for indoor decoration in pots, and to a smaller extent in baskets. A fine display may be kept up from April to

November by starting them in batches at different periods, retarding some, and raising seedlings for late blooming. Single-flowered varieties are the showiest, but a houseful of choice and refined doubles is an acquisition to any establishment, and give most satisfaction under glass. Some of the more floriferous and drooping habited kinds, after the style of *B. boliviensis*, are very effective when grown in pots or baskets and suspended from the roof of the house. Even here choice kinds may be used, having medium-sized and not too heavy flowers. Some are decidedly fragrant, and if encouragement is given to their selection, a scented strain might yet be a reality. Maréchal Niel and Fragrant Rose have this quality.

For exhibition purposes Begonias are most effective in tastefully and judiciously arranged groups; but even here quality is often overlooked, and preference given to mere display. Only medium-sized plants are capable of being worked into arrangements of this kind, with dwarf and erect-flowering kinds for the front. Large specimens are not so popular as they might be, for they are bold and effective when well grown and tastefully manipulated, so that the staking is hidden.

There is a promising future for tuberous Begonias as bedding plants. Pelargoniums in a wet season grow like cabbages; but are as green as kale. Whether it rains or shines, Begonias flower abundantly, and they are always dwarf and short-jointed out of doors. Of course, to make sure of a good display early in the season, tubers at least one year old should be employed. They may be started sufficiently early in pits or heated frames, so as to have them fairly into growth, but not showing bloom, and hardened off so that they may be safely planted out about the beginning of June. Thus treated, they do not experience the check that plants in bloom are certain to get if the weather immediately after should prove cold or dry. Seedlings selected as to colour are most suitable for this purpose; and those of stiff, erect habit and free-flowering character produce the finest display. Double varieties are more adapted for pot work, as the flowers are generally too heavy to withstand the effects of storms or wind or pelting rain. They will be still more extensively grown for indoor decoration, while the singles will be grown in thousands for bedding purposes. Figures would fail me to give exact data as to the number I have raised since I commenced

the culture of this noble race of plants ; they may safely be computed by hundreds of thousands, if not millions. About half a million were pricked off into boxes last spring, and two-thirds, consisting of seedlings of single kinds, were planted out in June, besides several houses 100 feet in length filled with pot plants, and several ranges of frames.

A pleasing feature of the nomenclature of Begonias is the rational method of giving purely garden names, which, although not rigorously adhered to, is very generally adopted.

Propagation.—There are at least four different methods of propagating tuberous Begonias, namely, by seeds, cuttings, leaf cuttings (as in the case of *B. Rex*), and division of the tubers. I approve of the first two methods only, for they are certainly the best, most practicable and profitable. Increase by cuttings is only essential in the case of choice standard kinds requiring to be preserved true to name. These are mostly used for pot culture, and are regarded as the most improved or advanced types of the race from whence the finest strain of seed is derived. Young shoots from near the base of the plants make the best cuttings, and may be inserted any time during the growing season, but the earlier they are taken the better will they root and form tubers. A few of the young growths that arise from the tubers in spring may also be taken ; but the fact must not be overlooked that to take the same liberties with them as with Dahlias would be ruinous to a good display of bloom on the old plants for a season. The cuttings should be inserted singly against the side of thumb-pots, in a compost consisting of loam, leaf-soil, and sand, in about equal proportions, and plunged in cocoa-nut fibre in the bed of a propagating pit or frame, and shaded till they have emitted roots, when they may be grown on if required for late blooming ; but the young plants should preferably be kept in the cutting pots until the following spring, and this is the more essential in the case of late-struck cuttings, though, where practicable, these latter should be potted and kept growing.

Propagation by seed is at once the most legitimate, speedy, profitable, and certain mode of increasing this class of Begonias, either for pot culture or for summer bedding. There will always be a certain amount of speculation with regard to the colour, habit, and character of the seedlings the first year ; but, if derived from a good strain, they seldom fail to give satisfaction, and may

be assorted for future work as they come into bloom. They may be sown at almost any time of the year, according to the convenience and requirements of the grower. For my own purpose, I find that the third or fourth week in January is the most suitable; and those who have a sufficient command of fire heat will find it advantageous to sow early in the year, as the seedlings are less liable to damp off than when they are germinated in May, June, or July.

The seeds are sown in pans or in shallow wooden boxes, in a compost of light, porous material, consisting of flaky leaf-soil, a little loam, and plenty of sharp sand. This is mixed, and used in a rough state, with some finely sifted material on the top to form a smooth and level seed-bed, which is pressed firm, watered, or more suitably dipped, and then the diminutive seeds carefully sown upon it. The pans or boxes are placed in a temperature of 65° to 70°, with more bottom heat. As soon as they can be handled, the seedlings are pricked out from time to time into other boxes with a finely pointed piece of wood, divided at the point so as to lift the seedlings. As they germinate very unequally, and in succession, the work of pricking them off employs some men and boys for weeks together. When the pricked-off seedlings begin to get crowded, they are transplanted into other boxes at a greater distance apart. By the middle of May they are ready for hardening off. During the first three weeks of last June a staff of men and boys were constantly employed in planting those now in the open ground. By that time a large proportion of them had commenced to bloom, and several thousand of the most promising doubles, some of them gems, were transferred to 48-size pots, and placed in new houses specially built for their reception.

The ground in which the seedlings are planted out is heavily manured, and roughly dug up to the action of frost in autumn. Old tubers intended for bedding out should be started about the last week in March or the beginning of April; small-sized pots will be quite sufficient for them. A warm and showery month of June, with rather drier weather in July and August, is the most favourable to *Begonias* in the open ground.

Pot Plants.—One-year-old tubers are the most generally useful for pot work; but those of two or three years' growth make the finest specimen plants. When four years old they

begin to degenerate, some sooner, some later; hence the necessity of raising young plants to keep up the standard of perfection. It may be said that

Age cannot wither her, nor custom stale

Her infinite variety;

but the life of the individual has to be renewed at moderately short intervals by cuttings or by seed.

The first batch of plants may be started about the end of January or the beginning of February, and they will flower in April or May, according to the amount of sunshine they enjoy and of artificial heat used. Successional batches of tubers may be put into heat during March or April to flower in June or July, and be it observed that the more slowly they are brought forward the more sturdy and durable they will be. Put them singly in small pots proportionate to the size of the tubers, in a compost consisting of equal parts of fibrous loam, leaf-soil, and sand, in a rough or lumpy condition. Press the soil rather firmly if short growth and a long season are desired, merely covering the top of the tuber. Stand the pots on a bed of cocoa-nut fibre or plunge them in it, and keep the temperature of the house at from 65° to 70°. Should the soil be dry at potting time give it a watering; after that water should be applied with discretion till the plants begin to grow freely. Tubers that have been wintered in pots may be put into heat, watered a little, and afterwards damped down with the syringe till they start into growth, and then repotted into suitably smaller sizes. Light is of great importance in the early months of the year, and it is all-important that the plants should be kept as near the glass as possible after they have started into growth, to encourage a short-jointed and sturdy growth.

Repot the plants before they become root-bound, and as the season advances and the temperature outside becomes milder, gradually give more and more ventilation, as upon a cool and airy atmosphere a great deal of the success in Begonia culture depends. Low span-roofed houses give most satisfaction. The soft and watery tissue of Begonias soon responds to favourable or unfavourable conditions; therefore let them have a house to themselves where possible, and no makeshift permitted. The smaller plants may be grown on the side shelves on ashes or cocoa-nut fibre, while all the larger and taller specimens may be

elevated on shelving—staging tier above tier in the centre of the house and near the glass. A free play of air amongst the foliage keeps it fresh and healthy, and a dry atmosphere prevents the spotting of either flowers or foliage, as the weather gets warm about April and onwards. More or less shading during the heat of the day will be required after that month. When the plants have finished flowering, or become useless for decorative purposes, stand them out of doors, in a sunny position, but sheltered from wind, and keep them watered till the leaves show signs of decay, after which water may gradually be withheld till the tubers ripen and the stems drop away. Remove them indoors on the approach of frosty nights.

WINTER-FLOWERING AND EVERGREEN BEGONIAS.

By MR. H. CANNELL, F.R.H.S.

ALTHOUGH not so numerous and effective as the tuberous-rooted varieties, and more limited in their range of colour, the evergreen Begonias nevertheless claim our attention on account of their flowering so profusely during February and March, a time when their more showy brethren are at rest. For this reason they are also often called Winter-flowering Begonias, a term which may fairly be applied to the whole evergreen class, although a really large proportion of them can be had in bloom throughout the year; so that they not only make our greenhouses gay and interesting during the dull days of winter and early spring, but likewise afford us pleasure out of doors during the summer months, thus possessing an advantage over the tuberous section which ought to make them more generally grown and appreciated than they are. And even the smaller variety in their shades of colour is partly counter-balanced by the great diversity and beauty of their foliage, several varieties having, even when not in bloom, a very pleasing effect amongst other plants. During the last few years hybridisers have been at work amongst the different classes, and the result has been the production of several good varieties for winter-flowering, with at the same time the additional attraction of highly coloured foliage, so that at the present moment we may be described as being on the turn-

table of more and stronger colours in the tuberous-rooted section of winter-flowering Begonias on the one side, and the *Rex* or coloured-leaved section, combined with better flowers, on the other, and at no very distant date this evergreen branch of the family will, in my opinion, form a more important feature in our conservatories during the dull months of the year than many of us at present anticipate.

The cultivation of most of the winter-flowering varieties is very easy and simple. The same compost (with perhaps one part more peat or leaf-mould) required for Zonal Pelargoniums and Fuchsias will be found most suitable for their growth. They require a temperature of 55° to 70° , and particular attention should be given to their having as much light as possible, which means, in other words, that the plants should be kept quite close to the glass during the early stages of growth, on account of the tendency of most of the varieties to make rather long shoots. This point is, I think, one that should be more generally observed by amateurs in growing most plants, and for the same reason small span-roofed houses are by far the best for soft-wooded plants in winter, or, indeed, at all seasons of the year. Solid earth stages are decidedly to be preferred; but if these cannot be had, the wooden stages may at least be covered over with thin slates, and then surfaced with shells, sand, or ashes. Keeping the plants scrupulously clean is another important item, as the flowers, and foliage too, are very impatient of being fumigated with tobacco. Cuttings taken from clean, healthy plants, free from insects and rust, strike readily during the summer in any propagating box, and if potted-on as they require root-room they will make fine plants for late winter-flowering. When well established, weak liquid manure should be given once a week, particular care being taken that it is not given too strong, which is a very common mistake with young gardeners, who often seem to think that if a little is good a lot must be better, than which there could be no greater error.

Regarding varieties, I will confine myself to those of the greatest floricultural value and effect.

B. nitida (syns. *obliqua* and *purpurea*) has shiny, dark green foliage, and produces fine flowers in large clusters of a silvery blush, and is one of the most useful of its class.

B. nitida alba odorata has smaller flowers, but of the purest white, and sweet-scented.

B. semperflorens gigantea carminea and *rosea* are almost identical, growing into fine bold plants with deep green foliage, and producing an abundance of flowers of a rich shade of rosy-red.

B. odoratissima, a sweet-scented variety of the *B. semperflorens gigantea* class.

Before proceeding any further, it will be as well to say that all the varieties above mentioned require to be well pinched back when in a young state, so as to cause them to branch out and form bushy plants; and, further, particular attention should be given to them, as although the other varieties I shall mention are very beautiful, yet it is these kinds that give the best effect in a collection.

We must not, of course, ignore the claims of *B. ascotensis*, which in a warm and suitable climate is a gem for bedding, with its lovely large clusters of pink flowers hanging in graceful profusion.

B. Carrierei, a cross between *B. semperflorens* and *B. Schmidtii*, is a variety that will smile under the roughest of treatment, and yields a mass of small white blooms throughout the whole season.

B. Carrierei villosa has very similar flowers, but a trifle larger, and the foliage and stems are more hirsute.

B. fuchsoides deserves mention for its long service. It produces flowers of a bright red colour, and from its extended habit can be made use of for training up and covering pillars.

B. Knowsleyana is of great value where many cut flowers are in request; it is very free and vigorous, with silvery-blush flowers.

B. polyantha, with its pretty green foliage and soft pink flowers, is the only variety which seems to me adapted for using in sprays and button-holes. It is an early-flowering variety.

B. Digswelliana, with soft pink flowers, is pretty and distinct.

B. Dregei is a very free flowering kind, with lovely green foliage and small white flowers. *B. Richardsiana* and *B. Richardsiana vastissima* (syn. *validissima*) are somewhat similar varieties.

B. hybrida Wellsiana is very pretty and effective with its drooping flowers of a clear soft red.

Bijou de Gand. Although the colour of its flowers is not of the brightest, yet being produced very often when the snow is on the ground, and when almost every flower is cherished, it delights and astonishes many people with its profusion of soft pink flowers. It has bright green foliage, and is of a dwarf bushy habit.

B. hybrida floribunda (syn. *multiflora*) is one of the prettiest and most useful, producing bright coral-coloured flowers the whole of the season.

B. weltoniensis, raised by Major Clarke, is another of the prettiest, and, considering its easy cultivation and its other merits, I consider it to be one of the best pot plants in cultivation, and certainly the most useful. It has deep green marbled foliage and flowers of a soft rose.

B. Sutherlandi has flowers of quite a distinct colour, a bright orange-amber tint, and blooms all through the year. I have seen it trained into a splendid specimen plant.

B. Ingramii (syn. *Saundersiana* and *Laura*) has deep green foliage and flowers of a reddish pink.

B. insignis (syn. *incarnata*) is a free and vigorous kind, with flowers of a lilac-pink shade.

M. Eug. Vallerand, a hybrid from the last, is of a dwarf bushy habit, with flowers of a soft crimson-red.

B. prestoniensis has rich orange-red flowers.

B. castanæfolia alba has blush-white flowers of medium size; it is also useful for bedding.

Paul Bruant has very pretty pointed leaves, and is very free flowering, showing a great superabundance of female flowers of a soft pink.

B. Verschaffeltiana is another bold-foliaged variety, with large ovate acutely lobed leaves and rose-coloured pendent flowers.

Comtesse de Nevelée and *Moonlight* are apparently alike partaking somewhat of the tuberous-rooted varieties; they have white flowers and continue in blossom for some considerable time.

B. geraniifolia is very floriferous, the pure white flowers standing well up above the foliage.

B. socotrana is a distinct and beautiful species, with bright rose-coloured flowers. It should be rested through the summer and started again in heat during September.

The dark-foliaged varieties are deserving of mention; and although *Saturne* and *B. hydrocotylifolia* are free, and continue in flower for some considerable time, the former being more effective than the latter, yet the premier position belongs, I think, to *Gloire de Sceaux*, which is of upright growth, and has large open flat flowers of a soft silky pink, which contrast well with its rich bronze foliage. It requires good treatment.

B. manicata has small pink flowers.

B. ricinifolia has large bronzy-green foliage not unlike those of the Castor-oil plant, and where a bold plant is required, throwing up a strong flowering stem which continues in good condition for a considerable time, this would be found a most useful variety.

B. undulata and *B. foliosa* (syn. *microphylla*) are both very useful for baskets, vases, &c. The former has deep green foliage with a lighter edge, the flowers being of a reddish-salmon colour. The latter has small dark green foliage, and is of a very graceful habit, with small white flowers tinged with pink.

The varieties *B. semperflorens alba*, *rosea*, *rubra*, and the new one named *Vernon*, or *B. atropurpurea*, are easily raised from seed, and on account of their pretty green foliage (excepting the last, which is of a bronze tint) and continuity of flowering are very useful indoors during the winter and for bedding out during the summer.

Although not so effective as regards their flowers, yet, taking their ornamental foliage into consideration, the following varieties are also well worth growing, and several of them are thoroughly evergreen: *B. argentea guttata*, *B. argyrostigma elegantissima*, *B. argyrostigma gigantea*, *B. maculata*, *B. metallica*, *B. olbia*, and *B. picta*, a kind having the appearance of a densely foliaged *Caladium*, producing flowers of a soft red. In *B. manicata aureo-maculata* we have another very effective foliage kind, the variegation being well sustained, green heavily marked with deep cream colour, and occasionally splashed with chocolate.

Having briefly alluded to the improvements in the coloured-

foliage class not strictly belonging to the *Rex* or winter-flowering family, I should like to draw attention to the variety named President de Boureuilles, which is a great improvement on *B. subpeltata rubra*, having claret-coloured foliage, shaded darker and thickly studded with hairs, and produces large silvery-pink flowers very freely. It is of very easy cultivation, and will be found most serviceable for the decoration of any warm conservatory. There are several others, chiefly of the Gloire de Sceaux type, with handsome foliage and pretty flowers.

Mention should also be made of the new kinds sent out by the well-known horticulturist M. Lemoine, of Nancy, which include crosses between *B. semperflorens* and *B. fuchsoides miniata*, *B. Roezlii*, and *B. Schmidtii*.

The beautiful new hybrid autumn and winter-flowering Begonias, Adonis, John Heal, and Winter Gem, are the commencement of a new race which will enable us to keep up a show of flowers between the season of the rich-coloured tuberous varieties and those of the true winter-flowering type. They commence to bloom in October and November, when the others are scarcely yet in bud, and are destined, when improved and with a little stronger habit, to form an altogether new, distinct, and lovely class. It is somewhat remarkable that though they are strictly tuberous, yet they are in flower when the other tuberous varieties are all at rest.

CONFERENCE ON APRICOTS AND PLUMS,

HELD IN THE SOCIETY'S GARDENS AT CHISWICK,

AUGUST 24, 1892.

THE APRICOT IN FRANCE.

By Mons. F. JAMIN.

THE Apricot, which appears to be a native of Western Asia, has been known in France for several centuries, its introduction dating as far back as the year 1450.

In the north and north-west of France it must be trained on a wall or on a fence, but under these conditions its fruits are as a rule only slightly appreciated. They ripen very unevenly, the portion of the fruit against the wall always remaining more or less green, whilst that exposed to the sun becomes more or less mealy.

From bushes or standards in the open air the fruits are far better; but, in order to ensure success, great attention must be given to details. The trees require a warm and rather calcareous soil, and should be sheltered from the north and north-east winds. In less favoured localities the Apricot will give good results if sheltered by other fruit, or even by certain ornamental trees. Unlike other fruit-trees, it will succeed in the gardens of large towns, and even those of small dimensions, as in them shelter is always to be found.

The great abundance of Apricots in some seasons does not influence the selling-price to any great extent, and they are generally very remunerative.

The varieties most largely grown in France are very few in number and to a great extent localised. By simply inspecting the wood it is difficult to distinguish one variety from another. Sometimes confusion may be avoided by noticing the distance—more or less great—between the leaves. In Apricot “Peach” and its sub-varieties, for example, the leaves are very near to each other, and the young wood consequently short-jointed, whilst in other kinds the wood is longer-jointed, and the leaves therefore perceptibly farther apart.

By means of the foliage Apricots may be divided into three great classes. First, the varieties with large leaves, the blade of which forms a right angle with the petiole, as in Apricot Royal, Commun, &c.; second, those kinds in which the blade of the leaf is rather tapering and forms a sharp angle with the petiole, as in Montgamé, Luizet, &c.; and, thirdly, the varieties in which the leaves are flaccid, wavy, and partly folded, as in Peach, Moorpark, Viart, &c.

The stone is also of some assistance in classification. It is generally of a bitter taste, but has a sweetish flavour in the following varieties, viz. Montgamé, Hollande, Blenheim, Luizet, &c. In Apricot Peach and its sub-varieties the stone is perforated—that is to say, it presents on one side a small orifice through which a needle may be passed. This is a characteristic which is not to be found in Commun or the Royal, and many others.

The Apricot is cultivated in many parts of France. The locality in which the fruits are chiefly ripened in spring is at Solespont, in the department of the Var. Here the fruits, though only of ordinary quality, are ripe by the 1st of June. When sending to market, about a dozen are packed in a small light box, and, notwithstanding their somewhat inferior quality, they readily find purchasers at a comparatively high price.

In La Limogne d'Auvergne a larger number of Apricots are grown, and these represent for the most part a variety with large white fruits bearing the name of the province. The entire produce is almost entirely utilised by the manufacturers of Apricot preserves, into which an appreciable quantity of Pumpkin pulp finds its way. It is easy to imagine the enormous profits realised by the manufacturers who were the first to direct their attention to this particular business.

In the valley of the Rhône, in the departments of the Rhône and the Isère, there are several places in which the Apricot grows remarkably well. For several years the variety Luizet—raised by M. Luizet, of Ecully-les-Lyon—seems to have excelled all others. The fruit is of good quality and ripens rather early, while the trees present a vigorous and fruitful appearance. The average income derived from Apricots in these three departments is said to exceed £4,000.

The Saumurois, in the department of Maine-et-Loire, is another

part of the country remarkable for the culture of Apricots. The variety Peach, and to some extent the less known *Précoce de Saumur*—closely related to *l'Alberge de Montgamé*—are the principal ones grown. The last-named is a good early sort, and is superior to the Apricots of the Var. Unfortunately, however, owing to the latitude of the district, the fruits reach the Paris markets rather late for realising very high prices. The average yield in this district is only estimated to return 10 francs a tree when in full bearing, and the number of trees seems to be about a thousand. Under the Apricots, Strawberries are grown with great success, and in the full season of their ripening two vans are daily loaded on the railway at Saumur Station for the Paris markets.

About twenty-two miles to the west of Paris, and along the banks of the Seine for a distance of about five miles, is to be found some remarkable land, which for centuries has been utilised for the culture of Apricots. This highly favoured locality extends in a circle as far as the parishes of Triel and Vaux, sheltered from the cold winds of the north and north-east by the heights of Hautil. In this region the soil is warm and calcareous, and everyone grows Apricots. Spring frosts rarely make themselves felt there, so that the crops ripen with great regularity. The trees (often more like large bushes) are planted from 12 feet to 15 feet apart each way. The stems are never very tall, 3 feet to 4 feet at the most, and oftentimes the branches bear fruit on a level with the ground, and thus the trees assume, more or less regularly, a globular or pyramidal form. The method of pruning back of the fruiting branches to three or four eyes is the same as that used for Peach-trees, and it is, speaking generally, the only method to which cultivators attach any importance.

Three years after planting, the trees generally bear fruit, the quantity increasing year by year, and the trees thrive without any particular attention being given them. Of course poor trees will be met with in this locality occasionally, but it may generally be concluded that such are quite the old trees of the neighbourhood, veterans two hundred years old being occasionally met with. It may be said that the trees are at their best for fruit producing between the ages of ten and fifty years.

In spite of the favourable conditions referred to, it cannot be

said that the yield of fruit is at all uniform in quantity or quality. Sixty pounds weight of fruit may be considered about the average yield per tree, and estimating the price at an average of 30 francs per 100 lbs., each tree will at this rate produce an income of 18 francs; but it almost invariably happens that besides fruit of ordinary size there are a certain number of first-class fruits, and even some few extra choice samples, which without the least trouble will realise half a franc per pound. It follows, therefore, that without any exaggeration one may consider the sum of 20 francs to be the average value of the fruit produced by a tree in full bearing. Growers who sell their crops on the trees, which is very often done, of course do not realise such a large income as this; but, on the other hand, they do not incur the expenses of gathering, nor of other items which tend to lessen the profits of those who pick and sell their own fruit. The annual sale of Apricots grown in this district is said to amount to a sum of £3,000 sterling. The common Apricot is almost the only one cultivated, and although the fruits are not of the finest flavour, they are largely used for culinary purposes. Choice preserves are made from the ordinary qualities of fruit, while the better samples are naturally reserved for the table.

In the above-named parishes (as well as throughout the whole neighbourhood of Paris) Apricot-trees are worked upon the stock of the St. Julien Plum. The plantations extend in a straight line along the banks of the Seine, which at this point is at an elevation of about ninety feet above the sea level. They occupy a narrow band or border along the river side of only forty feet or so in width, and are then far from reaching the top of the hill behind. A remarkable fact is that the soil does not appear to become at all exhausted. Every year the trees which perish from old age or other causes are replaced by new ones, which always seem to grow in a very satisfactory manner. The severe winter of 1879-80, however, played great havoc in the orchards of Triel and Vaux, but the majority of the trees have now recovered their usual healthy condition.

Descending the river Seine, and more to the west, is a small locality known as Tripleval, belonging to the parish of Bonnières. Here some equally fine plantations are to be met with, and so favourable are the climatic conditions that the inhabitants are enabled to even cultivate the Fig with great success.

At my own place, Bourg-la-Reine, the Apricot grows satisfactorily, but rarely produces anything like a good crop of fruit. Some trees planted twenty-five years ago in our nursery produce an abundance of fruit—at least every alternate year. They are planted in the midst of other fruit-trees, and are protected from ill-favoured winds by a screen of Elm-trees a little distance away. Some other specimens, however, of the same age and vigour, and only a few hundred yards distant from the preceding plantation, are almost entirely exposed, and all but sterile—a fact which serves to emphasise again the necessity of growing the Apricot under particular conditions if it is to yield a satisfactory crop of fruit.

PLUMS FOR THE MARKET.

By Mr. J. SMITH, of Mentmore, F.R.H.S.

ONE important factor in Plum-growing is the proper selection of soil. It is no doubt a very bad soil indeed that will not grow a Plum-tree, but to be successful in producing really first-class fruit a good deal of care, attention, and judgment are needed. For example, the situation selected for a Plum orchard should not be in a dry, warm position, but rather on an exposed and open site. Again, the soil should preferably be of a rather stiff, heavy loam, or even clay, if of a fertile nature. Strong clay when mixed with small flint stones seems to suit the Plum admirably, only in such a soil the trees must be liberally fed with rich manure.

There are two ways that Plums may be grown profitably for market, namely, either as standards on grass land or as bush-trees and standards mixed with Gooseberries, Currants, Raspberries, &c., for an under-crop. Standards on grass land should consist of trees specially selected, having a clean upright stem of six feet to the first branch, and the trees should be planted at about twenty feet from tree to tree. This will allow ample space for them to grow. The most profitable varieties for growing on grass are the different kinds of Damsons. These require very little pruning for some years after planting, and established trees need only be looked over occasionally in order to remove any cross-branches and small shoots from the centre of the trees. The best manner to apply manure is, I think, to

spread it on the surface, for the rains soon wash the goodness into the ground and make the surface soil rich, so that the roots have a tendency to come up to it instead of running down into the cold and poorer soil. The soil can hardly be made too firm round the roots. This I often think is one cause of failure. In rich and open ground the trees grow rapidly and the wood seldom becomes properly ripened, and the consequence is small and weakly developed blooms which seldom set. But where the soil is firm the growth will be proportionately firm, short-jointed, and well-ripened.

VARIETIES.

Victoria.—This I consider the most certain of all Plums. It is very rare indeed not to have a good crop on this variety; it may safely be termed the poor man's Plum, for it will always produce a crop when all others fail.

Early Prolific.—This, in certain districts, is the most prolific of all Plums, and, ripening as it does so early in the season, it always commands good prices. It was raised by Mr. Rivers, who grows it largely for market, and has thus described it: "This Plum has borne enormous crops this year. It is one of the heaviest Plums known. Although not of large size, the bushel weighs from seventy to eighty pounds, the weight of ordinary Plums being about sixty pounds to the bushel. This density renders it a most valuable Plum for preserving, and as a preserve or for cooking its flavour is unequalled."

Monarch.—The fruit is very large, roundish ova in shape, of a dark purplish-blue colour, and of excellent quality. The tree is robust and an abundant bearer, ripening from the 24th to 27th September. It also was raised by Mr. Rivers from the Autumn Compote.

Curlew.—Another of Mr. Rivers' new Plums. The fruit is large and of a deep blue. The tree is an enormous bearer, and equally with Monarch promises to become a favourite market sort.

Pond's Seedling.—A large handsome red variety.

For a late supply of fruit I should recommend:—

Belle de Septembre.—An enormous bearer and very suitable for growing as a bush.

Grand Duke.—A very large Plum, and good. It was raised by Mr. Rivers from Autumn Compote.

I should never recommend many varieties being grown for market; a few really sterling kinds that will give a good return yearly are what is wanted. Victoria and Early Prolific are typical varieties, and of these sorts it is hardly possible for a market gardener to have too many trees.

Cox's Emperor is a useful and fine large round Plum. Prince Engelbert is large, oval, and dark purple in colour, of excellent quality, and the tree is a great bearer. Diamond, a large oval purple Plum, is a good bearer and one of the best cooking Plums grown. Mitchelson is a medium-sized oval Plum. The tree is upright in its growth and very free. It is a good Plum for cooking or preserving. Sultan, another of Mr. Rivers' magnificent seedlings, is deep red and very productive. The Czar we also owe to Mr. Rivers. It is a very large and early variety, of a good rich flavour. The tree is very hardy and robust in growth, and the fruit is not so liable to crack as is the Early Orleans.

It is needless to name more varieties, as so much depends upon the soil and situation, and those named will, I think, be found the best, taking all points into consideration.

The best manure to use for Plums will, of course, depend somewhat on the nature of the soil. Surface dressing is the best mode of assisting the trees. Feeding poultry, sheep, and calves under the trees in orchards laid down in grass is an excellent plan, but where the soil is arable yearly dressings on the surface should be given of good rich manure, and, if there is no chalk naturally in the soil, lime may be used with advantage.

Avoid as much as possible disturbing the roots. As a rule the firmer the ground round the trees the better they bear—that is if plenty of food is given them by annual applications of manure. No class of trees should ever be allowed to become a thicket of small twiggy shoots. These can never produce good results, and if the trees show any tendency to produce such a thicket of small shoots cut them all out with a sharp knife. Encourage the strong healthy shoots by allowing them plenty of room for the sun and air to act upon them, and they are sure to produce good fruit if all other details are properly attended to.

Next in importance to the growing of the fruit is knowing the best means of gathering it and packing it so as to secure the best price in the market. The plan of placing a layer of poor fruit at the

bottom of the baskets should never be adopted, but all should be of one uniform quality alike. Should it so happen that a portion of the fruit is only of second or third rate quality, it should be sent to market by itself, and the best quality by itself. I am confident the salesmen would bear me out that this is far more satisfactory, not only to the purchasers, but also in the long run to the growers also. It is a great mistake, too, only to about half fill the baskets, as purchasers always know when they have full weight, and will only buy accordingly.

Large kinds, such as Victoria and others, ripen at different times, so that the trees should always be picked over at least three times. The first time gather only the ripest fruits, and this will allow those left to come to a much larger size and richer colour. The smaller kinds of Plums may all be gathered at once, which is often an advantage when a large area has to be gone over.

I may, in conclusion, make one or two remarks as to the prices obtained for Plums in the market. This varies considerably according to the season, and foreign consignments also have a marked effect on our markets. During the last seventeen years I have been sending Plums to market on a rather extensive scale. Some seasons we have sent off as many as sixty tons during the season. In bad seasons our supply has fallen to ten or twelve tons. But on an average we despatch to various markets from thirty to forty tons a year. The prices we have obtained have varied considerably. I have known really first-class fruit sell as low as 1s. 3d. a bushel, whilst in other years the same class of fruit has fetched 18s. a bushel, and very late in the autumn we have sold Plums for as much as 25s. a bushel. I mention this to show that it is not all profit in growing Plums, any more than with any other class of fruit. At the same time, I think that by growing Plums as bushes and standards, mixed with an under-crop of Gooseberries, Black and Red Currants, Raspberries, &c., a good margin of profit can be secured for the grower, always supposing that the soil and situation are suitable, and proper varieties of each kind of fruit selected.

A plantation of well-grown fruit trees is a sight well pleasing to see, but no one must for one moment suppose that it can be maintained for any length of time by a policy of "rest and be thankful." To keep all clean and in good order and good

health, constant care and attention are required, and where these cannot be bestowed I would advise people not to think of growing Plums or any other fruit for the market.

DESSERT PLUMS.

By MR. T. FRANCIS RIVERS, F.R.H.S.

THE Plum as a dessert fruit does not take the same rank as the Peach or Pear, and its position is limited to one class only, the Green Gage and its relatives; nor do they at present constitute a national industry of the same importance as the cooking and preserving Plums which are grown for distribution in our markets, and are supplied in enormous quantities, both of home and foreign growth. But there is a likelihood that, as the drying of Plums becomes an industry of greater value, dessert Plums will assume an importance far beyond the position they at present occupy, because the sweeter and more luscious the Plum is, the better will the dried fruit be.

It is not very easy to draw the line between dessert and cooking Plums, as some people, especially those who supply dessert at hotel dinners, consider a dish of large Victorias or Magnum Bonums quite good enough for this purpose.

The ordinary Green Gage is too well known to be described here, but there are many varieties which have been raised from it, ripening from July to October, and all possessing more or less the characteristics of the prototype. Among these the most prominent are the July Green Gage, or Reine Claude de Bavay Hâtive, and the Early Green Gage, in warm seasons ripening in July.

I remember, many years since, when the July Green Gage was introduced, that much interest was excited by its precocity and fertility. In one of those rare and abundant seasons with which our country is occasionally favoured some small transplanted bushes were literally covered with fruit. The flavour was, however, disappointing, and not in any way equal to the Green Gage as a dessert fruit.

These are followed in August by the Oullins' Golden Gage, a very large and distinct Plum, with a very refined and delicious

flavour, especially when grown on a wall; but it is also very good in many places from a standard or bush. In favourable seasons this Plum bears abundantly and makes a delicious preserve. It is not, however, profitable to grow as an industrial Plum, as it has a very tender skin, and, unless gathered when quite green, will not bear carriage.

The next Gage Plum to ripen is the Early Transparent, or Early Apricot, so named by my friend Dr. Hogg, but lately certificated under the name of Early Transparent. I had forgotten for the moment that it had been named the Early Apricot in the "Fruit Manual." This is also a Plum of very high merit; the flesh is delicious, separating freely from the stone, which is very small. There is no doubt that this sort possesses valuable qualities for drying, as it is a veritable sweetmeat. It is a profuse and abundant bearer, and is hardy, as I have heard my friend Mr. Pearson speak of it as succeeding well in Nottinghamshire.

Another Plum of the same race, the Denniston's Superb, is a valuable dessert Plum of great fertility, and this and McLaughlin's Green Gage complete the list of August Gages.

In September the Gages are continued by the typical Green Gage, the Purple Gage, the Bryanston Gage (a large and excellent variation of the Green Gage), the Reine Claude du Comte Althan, or Reine Claude du Comte Atthems, Guthrie's Late Green, Transparent Gage, Woolston Black, Golden Transparent and Late Transparent. The last-named has recently received a first-class certificate from the Royal Horticultural Society, and will, I think, be very largely grown in the Colonies for drying, the flesh being very firm and rich, and the stone very small and non-adherent. Those Gages are, I think, the best which ripen in September, and they will satisfy the most fastidious amateur.

The Reine Claude de Bavay—of which Boddaert's Green Gage and Reine Claude de Brahy are varieties—ripens early in October, and is succeeded by Coe's Golden Drop, which, though differing in form from the Gages, is said to have been raised from a Green Gage impregnated with the pollen of the Yellow Magnum Bonum, and must therefore be classed with them. It is a late dessert Plum of high quality.

The sorts I have enumerated are, I think, sufficient for the fruit garden. There are many other variations of the Gage

which it is scarcely necessary to name, as all resemble the prototype more or less.

Although the Gage Plums are certainly the best of dessert Plums, some other kinds, which are classed under the head of "free Nectarines" in Dr. Hogg's "Fruit Manual," are worthy of the palate of the connoisseur; these separate freely from the stone and are valuable and good sorts. In August the De Montfort is one of the earliest of this class, and in September Kirke's Plum and Angelina Burdett are rich and good. Golden Esperen, classed among the "free Imperials" in the "Fruit Manual," is an exceedingly good Plum. The Jefferson, a "cling Imperial," is justly popular and well known for its excellent quality. Decaisne, a Plum of apparently the same class, will probably take high rank some day; in warm seasons I have found it a very good Plum.

Amongst recent Plums, The Czar, which I have been fortunate enough to raise from seed, is a very delicate-flavoured dessert Plum when grown on a wall; it ripens early in August, and is a most abundant bearer. The Mallard is an early August Plum, very large, with rich and juicy flesh. The Grand Duke, a very large purple Plum, ripening after Coe's Golden Drop, is a wall Plum of very fine flavour, and when grown under glass in pots will hang for a long time. Since the introduction of the orchard-house I have been astonished at the facile manner in which the Plum lends itself to pot culture. No fruit is more easily grown in pots. Apparently shy-bearing sorts like the Transparent Gage become miracles of fertility in pots placed under glass during the period of blooming, and kept there until the incoming warmth of summer has in some degree moderated the severity of our English springs. They may then be removed to an open border, or, if birds are troublesome, they may be placed under a structure of wire netting. Even so-called kitchen Plums, under such treatment and with a plentiful supply of water, become both sweet and good.

The results of Plum pot-culture are extraordinary; but to ensure fine fruit with good flavour thinning is necessary. An orchard-house furnished with Plum-trees, arranged with different colours, is a very pleasant sight when the fruit is fully developed. The late Plums will hang on the trees for a much longer period than those grown out of doors. The Monarch, Grand Duke, and Coe's Golden Drop are valuable for this purpose. On walls old

trees of Plums will produce fruit of extraordinary size and richness of flavour. I have known the Early Orleans and Goliath become dessert fruit. They are, however, although pleasant, rather flat and insipid; their principal merit always appears to me to be the ease with which they can be split open. Old and apparently worn-out trees of the Green and Purple Gages on a wall are worth keeping, although the fruit is produced very sparsely. Its excellence when borne by these decaying trees has, I think, given rise to the traditions of the wonderful Green Gages produced in former days, accompanied by lamentations that the true sort no longer exists. This is hardly true, as the Green Gage is still to be found. Unfortunately the facility with which the Green Gage reproduces its characteristic excellency has been the means of introducing a number of varieties which do not equal the prototype, a raiser of seedling fruits being generally in the habit of thinking that his own seedlings must be improvements on all existing sorts.

ROOT PRUNING OF FRUIT-TREES.

By Mr. GEORGE BUNYARD, F.R.H.S.

[Read September 6, 1892.]

THOSE who would maintain a proper balance between the growth of a fruit-tree and its production of fruit can only do so by attention to the position and development of the roots. Left to itself, the natural tendency of a fruit-tree is to make foliage and timber at the expense of early fertility.

Roots are generally classed under two divisions; the surface roots, being for the most part fibrous, are supposed to have a closer relation to the perfecting and production of fruit-buds and fruit than those tap-roots which strike down, and to these latter the growth of woody extension shoots is generally attributed. Cultural science has taken advantage of these distinct and special root functions, and has assisted nature in the production of fruit at an early stage of the life of a tree by using what are called dwarfing stocks—viz. the shallow-rooting Paradise stock for Apples and the Angers Quince stock for Pears. The nature of these stocks is to root on the surface, and this they will do if sufficient nutriment is provided for them; but, failing this, they

will gradually lose their valuable fibrous nature and strike down for maintenance, and the trees will then be hardly distinguishable from examples worked on free stocks. Deep digging and heavy soils foster this pernicious habit and throw the trees into a woody growth—when, should the roots strike a cold or ungenial subsoil, canker will inevitably set in, and the fruit will be spotted and mildewed. Both evils will disappear under the treatment of lifting the roots and nourishing them with fresh new soil.

We will first take the case of large wall-trees—say Pears. These in past times were only worked on the free stock, and consequently it is dangerous to root-prune them entirely at one operation, as they will probably be found to have coarse anchor-roots far away from the parent stem; we therefore take the right half of the tree, at the end of October, when the leaf is still on. First open a trench, and wheel away the soil, to give the operator room to work, say 3 feet to 4 feet from the wall and the stem, and carefully dig down with a fork, exposing all the roots (A) which are met with to a depth of 18 inches or 2 feet; if these are but few, then work under the mass of top earth left undisturbed between the trench and the wall, and seek for tap-roots, which when found must be severed with a sharp knife, saw, or long-handled chisel and mallet. The lower part of the root should be got out if possible; but if this cannot be done, then as much of it as can be met with should be cut away, and, before filling in the hole, a tile or slate should be placed under the root already cut, to induce new roots to assume a horizontal position. Follow out this under-search for tap-roots for 6 feet on the right hand, and if no more are found in this distance, there will be no necessity to excavate further. The roots already alluded to (A) can now be shortened back with a sharp knife, and some little judgment is required in doing this; for example, if only three or four are found, they must not be so severely cut back as if double that number present themselves, or it will be too great a check to the tree. In the following October the left half of the tree can be operated on in the same way, and by so doing growth will not be interfered with. It is advisable to cut in the tree closely as soon as the root-pruning is done, to prevent undue evaporation from the leaves; and if the remaining foliage can be syringed for a time in dry, hot weather

the tree will suffer less, and the returning sap will at once commence to heal the wounds where the roots are cut, and in some cases embryo fibres will form before Christmas. If the border is already rich there will be no necessity to add manure ; but it is important to refresh it with maiden soil, and to see that it is friable and in a damp but not wet condition, to envelop the roots and assist in the formation of new fibres. Where fresh soil is not available, the parings of lawns, with road grit, wood ashes, &c., may be used.

Espalier trees may be treated in a similar way, except that only one entire side should be acted on at first, the opposite side being left for pruning the next year.

And here let me state what is so often overlooked or 'disregarded, viz. that all fruit-trees delight in a hard and close soil to root in. Wall trees, therefore, should never have a crop of vegetables within a yard of the wall ; this 3 feet need never be dug, but a slight forking on the surface will enable the mulching to act more freely and allow the rains to reach the roots, and also prevent evaporation. It is when the roving roots reach the heavily manured, frequently dug vegetable quarters that wall trees, to use an expressive term, "go wild," and this stimulating soil prevents the proper ripening of the wood and settling of the sap before winter comes with its penetrating frosts. Many old wall-trees are also too crowded in the spurs and branches, and when root-pruning some of these may be removed with advantage.

Of all garden trees the pyramidal form is the most neglected. In fact some are merely pruned in with shears, and beauty, or rather correct outline, is more considered than fruit. These neglected pyramids require stringent measures. First remove, with a sharp American lightning saw, all the main branches which are not required to keep the desired form ; then shorten all the side shoots to three or four leaves, leaving the top shoots free ; then attack the roots, carefully preserving every top fibre, and working all round the tree, about 3 feet from the stem, expose the roots, and work under the ball to get at the tap-root or roots ; shorten them and introduce the tile as before, and then fill in the whole with fresh soil, wood ashes, &c., and raise a little the fibres and smaller roots exposed, and spread them out, shortening them as the work proceeds. If the soil of the

ball should crumble and fall, exposing the whole mass of roots, it may be as well to dig up the tree entirely and cut in the roots, and replant it as much on the surface as possible; this may check and imperil the crop for the first year. Such trees will need to be well secured by stakes after the operation, and care is required as to syringing as long as foliage holds, and further mulching in the spring. If the pyramids are very strong, one side of the roots only need be pruned at an operation. In order to keep up the supply of fruit it is best to root-prune only a portion of the stock at any one time, retaining the rest for future attention.

Cordons on walls, or as horizontal edgings, are more readily root-pruned, as being on fibrous-rooting stocks they can, if regularly lifted every two or three years, be attended to without loss of crop; but in all cases they ought to be root-pruned before the foliage falls, and after the crop is gathered.

It frequently happens that Apricots, Peaches, and Nectarines indoors make too free growth; but being on a Plum stock, their roots are abundant, and mostly on the surface of the borders, so they can be readily lifted entire, and be pruned and replaced, adding fresh friable soil round the roots, and with a good watering, and daily syringing for fourteen days, they recover from their move and do not suffer at all, but are benefited in every way by the operation. When the trees are off the trellis or support they should be deprived of every useless or ill-placed shoot, and the tree be dressed with the usual materials to cleanse it. The operation of root-pruning can be safely performed as early as Midsummer, if an early forced crop has been produced; but when root-pruning has to be done thus early some shade is necessary, and the peach-house should be kept damp and close for a few days. Peaches, Nectarines, and Apricots on outside walls may be root-pruned in October.

Figs are greatly benefited by root-pruning, and a check to the formation of gross wood is very desirable. I am in favour of the introduction of brickbats, stones, and clinkers, with ashes, as they absorb warmth, and the Fig roots delight in contact with them. Under glass Figs are readily attended to, but as a rule they grow too freely outside to ripen their wood, so that a liberal root-pruning and root-lifting are most beneficial.

Plums generally grow too freely in a young state, and are

easily operated on, their masses of roots giving the operator no trouble to examine, and even large trees may be lifted outright with advantage early in October. If this is not done, a mass of strong shoots will form at the upper part of the wall, tending to weaken and destroy the lower and more fertile boughs, while the Greengage class will amply repay attention by producing more fruit, and that of higher quality. Pyramidal, cordon, and columnar Plums may safely be lifted whenever the wood growth is excessive, but while they remain fertile they are best left alone.

Cherries.—These require very careful handling, whether on the Mahaleb or free stock, as they naturally form very coarse roots, and therefore suffer severely on the loss of support from them. Where it is desired to keep them in check, as in upright cordons or pyramids, they should be lifted every year and have extra care in replanting, and receive a free use of the syringe after the operation. Those of the Morello and Duke race succeed best under this treatment. The Heart and Bigarreau section make very strong wood, and any undue severity in pruning either tops or roots will produce gumming, and often destruction of the trees. It is said that early winter pruning is best, as it helps to prevent the flow of sap in spring which leads up to gumming.

I am fully aware that the demand on the gardener's time in September and October is often so heavy that he can rarely find opportunity for carrying out a systematic root-pruning, but I may remark that it ought to be a part of the regular routine work in a garden; wet days could be utilised for the indoor trees, and a little extra help might profitably be imported for an operation which saves time in summer and produces such evident results.

I have said little as to the application of manure to newly root-pruned trees. Where the operation has been severe I would advise a good mulching to be applied, but not otherwise, as it tends to obstruct the sun's rays. Warm soil is essential to an early recovery after the mutilation of the principal roots. I prefer to water very heavily in May, when the roots are active, following this with a good manurial mulch, either of stable dung fresh from the yard, or by the application of liquid manure direct, or watering-in any of the usual artificial stimulants, as Ichthemic Guano, Thomson's Vine Manure, or such like aids.

I ought also to say that only half a crop should be taken the

first year from root-pruned trees, which fruit (although it may be smaller than usual) will generally be found of first-rate quality.

As orchard-house trees in pots are being increasingly grown, I may remark that the same general rules apply to these interesting trees ; but if planted out, the operation must be performed before the leaves fall. Pot trees can readily be attended to in potting up, and it adds point to the practice when we see what grand fruit is produced in 9-inch or 10-inch pots, showing that, with

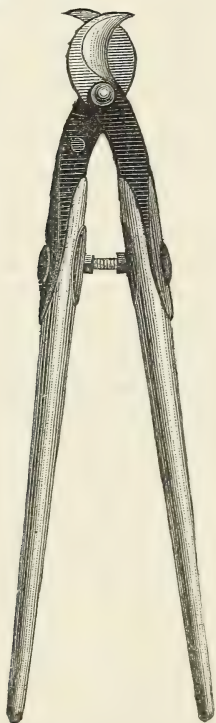


FIG. 16.



FIG. 17.

due attention to food and water, wide-spreading roots are not essential to the production of fruit.

Root-pruning is rendered easier by the use of the following tools :—

- (a) Vine pruners (French lopping shears, fig. 16).*
- (b) Lightning saw (American, cutting on both sides).
- (c) Secateurs, Aubert's (fig. 17).*

* Engravings kindly lent by Messrs. C. E. Osman & Co.

To sum up the benefits of root-pruning, for the information of the uninitiated, the operation—

1. Induces fertility.
2. Cures canker and spot on fruit.
3. Improves the flavour.
4. Prevents the formation of useless shoots.
5. Reduces the labour of top-pruning.

To illustrate these remarks, I may quote the case of a garden noted for its grand fruit. On planting, the land was trenched 6 feet deep, and for a few years the trees grew very fast and prospered, producing gigantic fruit, though not in any great abundance. Suddenly the foliage of the Pears and Apples became yellow at the tips, and mildew set in, and then canker appeared. The trees had been induced to root deeply by the best soil being placed at the bottom of the trench, and on their gaining the desired food, they exhausted its goodness, and were too far from the surface to gain much by mulching. Many died outright. By degrees they were lifted and placed in better conditions, and when last I saw them finer crops could not be desired, or better specimens of cultural care. It was an initial mistake to trench the land so deeply.

THE VARIABILITY IN CULTIVATION OF HARDY FLOWERING PLANTS.

By the Rev. C. WOLLEY DOD, M.A., F.R.H.S.

[Read September 20, 1892.]

GARDEN flowers which have never been matched amongst wild forms are supposed to be produced by cultivation, and it is generally assumed that cultivation improves flowers.

I will define cultivation to mean giving plants room for their full development, both above and below the surface, in tilled ground. This definition does not claim to be complete, but it is sufficient for our purpose to-day.

Let us suppose, then, that for several successive years the whole produce of a plant and of its seedling offspring could be brought to maturity, would the last generation from seed present greater development in variety of form and colour, if the plants had all been grown in cultivated ground, than would be the case in a wild state in their native home?

Unfortunately, such an experiment cannot possibly be made. In nature, whether a plant lives one, or ten, or twenty years, and ripens yearly ten, or a hundred, or a thousand seeds, only one of those seeds on an average reaches maturity, to replace every plant that dies; but in cultivation we may produce a flower from every seed which ripens, so that the chances of variation are indefinitely multiplied, and we must allow for this before we conclude that it is cultivation which *causes* the varieties.

Again, it is hardly possible to separate the effects of cultivation from that of selection and the spontaneous crossing of the selected varieties; if good forms continue to be selected, and inferior forms excluded, the result is obvious, but this is an accident of cultivation and not a necessary consequence.

But if we notice what takes place in a garden where many plants obtained from a wild source are grown together in cultivated ground, and their seedlings allowed to grow up, without any selection or artificial crossing, we may obtain some clue to the effects of cultivation alone. I am not going to enter upon the subject of changes which may have occurred in long ages, where the origin of a cultivated plant is almost lost in obscurity. I confine my remarks to sudden and rapid development during a few years; and though the phenomena of one garden, on a soil unfavourable to the improvement of flowers, observed during only twenty years, must be very limited, I have thought they may not be without interest in their bearing upon the question I have raised. When I speak, as I propose to do, of the difference between the plants which I have planted in my garden, and the plants I find there a few years afterwards, it is obvious that I must include the changes due to spontaneous hybridising of different species and spontaneous crossing of varieties of the same species. These changes are inseparable from the cultivation of many plants together, and when closely allied plants from different countries become neighbours it is instructive to watch the results.

The changes generally attributed to cultivation, of which I propose to speak briefly, in order, are :—

- (1) Changes in stature and luxuriance and size of the flower.
- (2) Changes in the colour of the flower.
- (3) Changes in structure and form.
- (4) Changes in seed-producing habit.
- (5) Double flowers.

I must repeat that I am not going to discuss what are usually called florists' flowers. It may perhaps be called the first step towards florists' flowers of which I treat, and that step is often the most difficult to make. After the first departure from the type is made in the right direction, diligent gardening generally does the rest.

Before entering upon details, I wish briefly to notice common sources of error if observations are made casually or carelessly. We are often told of changes in form or colour of flower coming on in a plant, which when investigated prove to be only apparent. I am not speaking of exceptional sports, which may take place from single to double, or from one colour to another, but of alleged habitual changes in a plant itself. For instance, I have spent much trouble during twenty years in satisfying myself that the single wild Daffodil does not change by cultivation into the large double Daffodil, and that the common yellow Primrose does not alter the colour of its flower upon the same plant.

A common source of error arises from a seed falling and growing up in the middle of a plant of some distinct variety, and producing the type instead of the variety, which it gradually supersedes by more vigorous growth. Thus I have seen *Geranium lancastrense* seem to change into *G. sanguineum*, and *Campanula turbinata* into a pale blue *C. carpatica*. Such errors are detected by careful examination.

(1) To begin with changes in the growth and flowering of an individual plant when brought into cultivation from a wild source. The stature and luxuriance are often increased, but in many instances, especially in plants from high elevations, there is a deterioration of the flower. For example, *Ranunculus Gouani*, which in the high pastures of the Pyrenees is a dwarf plant, the large flowers almost hiding the leaves, becomes in my

garden a leafy plant a yard high, with flowers hardly larger than those of *R. acris*. Similar changes, perhaps less in degree, take place in nearly half the plants we bring home from mountains and rocks. But it is not so with all; for instance, *Ranunculus amplexicaulis*, dug up by me in the same mountain home as *R. Gouani*, produces year after year larger flowers than I ever saw upon it in the Pyrenees. We must not, therefore, conclude what a plant will do in cultivation without the test of experience. Many wild plants when raised in gardens from seed show a remarkable increase of stature; instances of this are *Campanula glomerata* and *Veronica spicata*, both of which I have grown at least three feet high. But to many of our most beautiful native plants, cultivation, as I have defined it, is an abhorrence. Blue Chicory and Viper's Bugloss will not produce in garden beds the colour they show on barren chalk banks, and *Carduus acaulis*, so beautiful on the South Downs, degenerates at once in cultivation, developing long stalks. Some things, which soon die when I transfer them to my garden, seem to require the competition of other roots; such are the common Polygala, the Winter Greens (*Pyrola*), and *Orchis Morio*.

(2) Change in colour of the flower. Of real change of colour in an individual plant I have had no case in my experience. The damp soil and sunless climate of my garden often make flowers deficient in their proper colour. Delphiniums come washy purple instead of clear blue. What came as a blue Primrose from a friend's garden is in mine a dull red. Such colours run or fail, but are not really changed. The real changes in colour said to be due to cultivation are those we see in the coloured Primroses and Polyanthus, the Dutch Hyacinth, the varieties of *Pyrethrum roseum*, &c. All my experience proves that the first change of colour, ending in the divers shades of florists' flowers, is as likely to take place in nature as in a garden, though less likely to be observed, and for obvious reasons less likely to be perpetuated. I have corners in my garden where the common wild Primrose, or where the Bardfield Oxlip is allowed to seed and grow in cultivated soil, and from time to time the soil is renewed and the plants thinned. Now and then flowers are produced of a dull pale red; but these, if not separated, soon disappear again. Wherever Primroses abound in a wild state I have now and then seen these dull red flowers, as well as some

of pure white, even so far from gardens as to be beyond suspicion of cultivated pollen. Again, of those native plants which may be said to have ornamental flowers, I think I have found white-flowered varieties growing wild of nearly one-third; and I have even seen wild varieties of every shade between white and the typical colour. Near Llandudno is a limestone hill on which *Veronica spicata* grows in abundance. I never found more than one plant there with white flowers, but every shade of purple and pink may be picked out. In some lanes in Cheshire I have seen the colours of *Campanula rotundifolia* vary nearly as much. Now if cultivation of itself encouraged this change of colour, we should find a greater tendency than we do find both to call into play the power which nature has of varying the colour where we have planted only one colour, and also a greater tendency to revert from an abnormal colour to that of the type. Here are a few facts bearing on this subject.

Twenty years ago I planted in my garden in Cheshire a white-flowered Musk Mallow, accidentally found by the roadside. This plant sowed its own seeds, and amongst thousands of seedlings which flowered in the next ten years all had white flowers. I then introduced a plant of the same species with the normal pink flowers, and, though I soon expelled it again, I had to weed out pink seedlings from white for several years. I had just the same experience of the white variety of the biennial Moth Mullein (*Verbascum Blattaria*), which I raised from the seed of a wild plant; it gradually grew in all parts of my garden, and was for several years quite constant, until I introduced one of the yellow-flowered type. *Geranium Robertianum* has afforded another example of constancy to colour; a plant of it with white flowers found on a wall at Matlock has filled my garden with its seedlings, but I cannot find one amongst them of the typical colour, though the type abounds in the woods close by. But some plants revert at once to their normal colour from seed, if I try to establish a white variety. The common white Harebell rarely gives me a white seedling. The white Foxglove, if grown in isolation, can be trusted to be constant. I raise it year after year from bought seed, and it comes true; but of seed saved in my garden from white plants, where the purple type is common in the neighbourhood, not five per cent. come white. The Welsh Poppy (*Meconopsis cambrica*) has grown abundantly in my

garden for at least half a century, flowering not only in neglected corners, but in the richest flower borders. Yet cultivation never called forth in it its power of producing orange-coloured flowers, until I introduced, five years ago, the orange-coloured variety from the Pyrenees, where it is common. Both yellow and orange seedlings are now produced by it.

I may state generally that I have never observed in my garden any distinct change in colour in plants raised from seed of the normal type which could not be accounted for by some cross with another plant in the garden.

(3) The third class of changes we observe in cultivation is the most frequent and the most remarkable. Without any intentional crossing having been practised, we find that seedlings show characters differing from those of the seed-parent. This may arise sometimes from the development due to cultivation, but it is caused in most cases by a spontaneous cross with the pollen of some different variety of the same species, or by spontaneous hybridising with a different species. The results of these crosses are so various, and the mixed characters so puzzling, that botanists generally dislike committing themselves to name garden flowers, but if pressed to give a plant a specific name they naturally choose that to which the plant shows the nearest affinity, and I find that this is as likely to be the presumed pollen-parent as the seed-parent. It often happens also that in gardens two closely allied species seem to combine into one, their offspring losing the distinctions which the plants maintain in their respective homes. I shall mention several cases where this seems to be the case. I find that no rule can be laid down concerning the fertility of these hybrids. Some seem entirely barren; others produce fertile seeds sparingly; whilst in some genera they seem quite fertile, though seldom constant. There is often a tendency to approach nearer to one parent in each successive generation, affording a presumption that the hybrid is fertilised not by its own pollen, but by that of one of its parents. I have rarely seen an instance in which two distinct species combine into an intermediate garden form which is constant from seed, and sufficiently different from either parent to deserve to be retained as a garden species. *Lychnis Haageana*, if really a hybrid, is a noteworthy example of such a plant. Under this head I speak of plants which have sprung up

in my garden different from what I planted, but which I know to be the spontaneous offspring of them.

Whilst in several genera many of the species cross so readily that I have found it hardly possible to keep them true from seed even for a single generation, other classes of plants go on from year to year reproducing their parent without any suspicion of a cross. The most habitual and persistent mixing of species I have seen takes place amongst Columbines. Every kind seems to cross readily with every other, long-spurred and short-spurred, yellow, blue, and red; I never can tell what home-saved seed will produce. In their native land Columbines do not seem to vary much. I have observed thousands of plants of *Aquilegia vulgaris* in the Pyrenees which were all constant. So it is with the American kinds. I have raised many a lot of seed collected wild, and the plants are uniform in colour and character. So it is if one kind is isolated; a nurseryman at Forres, in the Highlands, has for thirty years supplied the market with *A. glandulosa*, which has proved these perfectly constant. But where grown together the plants continue to change in every generation, and, as all the hybrids are more or less fertile, there is no limit to the degrees of mixture. Still I notice a decided tendency in each successive generation to draw towards the most robust type, which in my garden is *A. vulgaris*, and I believe, if left for a few years to themselves, they would all be absorbed in this.

The genus *Dianthus* is quite as prone to cross as *Aquilegia*. I have never tried to make a florist's flower out of it, or had recourse to selection; but I save the seed of the small alpine species, and raise it, and allow the more robust kinds to sow their own seed and to come up indiscriminately. Both the dwarf kinds, of which I may call *D. alpinus* the type, and the taller umbellate forms, of which the commonest is *D. barbatus*, hybridise freely amongst themselves and with one another. Some of the larger kinds intermix so as to make it hopeless to determine the species to which their parents belong. Such plants as *D. cæsius*, *D. fragrans*, *D. petreus*, *D. plumarius*, and one or two more seem to combine in a race of fertile hybrids, the flowers varying greatly in size and colour, and in the fringed or even margin, none of them, however, being constant from seed. These kinds seem to tend more and more to a form,

which I believe belongs to *D. plumarius*, with a long fringed margin and generally with a dark eye. In others the inclination in successive generations seems to be towards *D. barbatus*, which I take to have very powerful pollen. The species which seems most susceptible of foreign pollen is *D. superbus*, which rarely comes true from seed collected in Edge garden, the seedlings often approaching *D. barbatus*. There is one very dwarf and very early kind, excellent for rockeries, and sold in many nurseries as *D. glacialis*, but being, I believe, a hybrid of *D. alpinus*. This is the only single *Dianthus* which I have grown for many years (except the well-known *D. Atkinsoni*) without ever being able to obtain a seed from it.

I have already mentioned the variability in colour of *Veronica spicata* in a wild state; and botanists know that other Veronics, such as *V. Teucrium*, are by nature very variable in form. Hence we should expect them to be puzzling plants when allowed to grow from seed in gardens, and I have found them to be so. The dwarfest form of *Veronica spicata*, found in the eastern counties, where I believe it is constant in colour, retains its dwarf form when transferred to my rockery; but in the first generation from seed the seedlings range from one foot to three feet high, though showing no sign of hybridisation. I have, however, many nondescript Veronics which have seemed to come of themselves, and are probably hybrids, though I have looked in vain for evidence of a hybrid between those which produce a terminal spike and those which have axillary corymbs of flower. A common abnormal form in the spiked Veronics, perhaps due to luxuriance in cultivation, is that called "corymbose." The individual flowers of the spike are transformed into secondary spikes, collecting into the form of a corymb. I have seen it in several species.

Another genus, *Verbascum* (the Mullein), hybridises freely in my garden; but its hybrids, as far as I have examined them, have seemed barren, and difficult to perpetuate. They follow, in duration, the habit of the shorter-lived parent, a biennial crossed with a perennial being biennial. The most interesting and frequent hybrids are made by *V. phæniceum*. This perennial, of which the type is dark purple, with an occasional individual pure white, follows the habit which nearly all such flowers have, of varying through every intermediate shade.

The hybrids it makes with the biennial *V. Blattaria* are nearly as variable in colour, but are straggling and untidy plants; but the hybrids it makes with the perennial *V. nigrum* are less variable in colour, being different shades of copper or orange, but for dwarfness and abundance of flower are excellent for gardens, though I have found them difficult to divide, and not lasting many years. Other hybrids in the genus often occur, but are less noteworthy.

Interesting and remarkable mixtures, which, like those last mentioned, seem barren, take place in my garden in the genus *Polemonium*. The common Jacob's Ladder is not thought a very ornamental plant, and as it is a profuse seed-bearer it generally gives trouble in weeding, so it is not a favourite. But amongst those seedlings which escape there are many hybrids. Three species which have long been common in my garden are (1) *P. cœruleum*, including the dwarfer form generally miscalled *P. Richardsoni*, and the large Himalayan variety; (2) *P. reptans*; (3) *P. humile*. I am not sure that No. 1 and No. 3 mix, but hybrids between No. 1 and No. 2, and between No. 2 and No. 3, are frequent. But the most remarkable hybrid in the genus is a plant identical in flower with *P. cœruleum*, both in its blue and its white form, which I have raised more than once from seed collected in my garden of *P. flavum*. It is entirely barren, and in this and two or three other ways an improvement on the old type. Another change comes in *P. cœruleum* from luxuriance of growth, and has often appeared spontaneously in my garden. The leaf becomes bipinnate in form. This variety used to be figured and sold as a distinct species named *P. sibiricum*. It would be easy to enumerate other changes in plants probably due to crossing. I will now mention a few cases in which closely allied species produce from indiscriminate seeding a doubtful series, some amongst which might pass by the name of either parent.

The common Harebell, *Campanula rotundifolia*, combines with *C. rhomboidalis* on my rock beds, so that no line can be drawn between them; the seedlings appear fertile, and increase the confusion. *Linum flavum* becomes very variable from seed, not only in stature, ranging from 6 inches to 2 feet, but also in breadth of leaf and in size of flower. I have more than once obtained seeds and plants under the name of *L. campanulatum*.

If they have been true, these two species certainly pass into one in my garden. Their seed-bearing is most profuse. I mention this incidentally, because Darwin, in his work on "Plants under Cultivation," says that *Linum flavum* never ripens seed in English gardens. *Scilla nutans* and the Spanish Squills, *S. campanulata* and its close allies, seed together and produce intermediate forms which cannot be distinguished. *Malva moschata* seems to mix indiscriminately with *M. alcea*, and the plants are all quite fertile.

Geranium argenteum and *G. cinereum* are produced indifferently from one another's seed. There are three very fine species of *Inula*, named respectively *I. Hookeri*, *I. glandulosa*, and *I. grandiflora*. The first and second were distinct when they first came to my garden, but seed of the first has produced an intermediate series joining all three. Another set of plants which I find run together when grown from seed collected in my garden is the Lent Roses, *Helleborus orientalis* and five or six other species named and described by E. Boissier in his "Flora Orientalis." The late Herr Regel, of St. Petersburg, found the same result, and proposed to join all these species into one; but each is said to be constant in its native home.

I have mentioned only a few out of many cases where plants of the same genus seem to hybridise spontaneously and habitually when grown together. These cases must be distinguished from hybrids artificially produced from selected parents.

But lest it should be supposed that such crosses as I have enumerated are the universal rule amongst nearly allied plants, I will tell of cases where plants seemingly very nearly related remain quite constant from seed, though flowering every year side by side, simultaneously.

Take as a contrast the two genera *Narcissus* and *Crocus*. In the first every species seems ready to hybridise with every other. In the second, though seedlings come up and flower by thousands from different species growing together in the same clump, I have never seen a hybrid. No hybrids ever come in my garden from *Anemone*, though some of the species, such as *A. nemorosa* and *A. japonica*, vary much within themselves. I raise thousands of *Anemone* from the seed of my garden every year. *A. hortensis* never mixes with *A. coronaria*; *A. blanda* never with

A. apennina, though their flowering time overlaps. *A. alpina* and *A. sulfurea* keep quite true to colour from seed. In the same way *Ranunculus* is a constant genus, though botanists have given the ambiguous name "hybridus" to a good and constant alpine species. *Gentiana* is constant; *G. acaulis* and *G. verna*, *G. septemfida* and *G. asclepiadea*, which flower together side by side, continue true. I should a year or two ago have said the same of Poppies; but I have a puzzling set of Poppies, in which *P. orientale* seems to have crossed with *P. rupifragum*, which is the seed-parent. These are absolutely barren, and are still under investigation.

(4) The fourth of the questions I raised, whether cultivation increases or decreases the seed-bearing power of flowers, admits of no general answer. Seed-bearing often depends upon a combination of accidents independent of cultivation. An unusually hot and early season, a change of soil or position, may often alter our conclusions. Luxuriance of growth is not in itself, as some suppose, an obstacle to fertility, unless it causes the flowers to be double; and it is well known that even in some forms of doubling the seed-bearing organs retain their power.

Looking to my own experience of plants remarkable in Edge garden for luxuriance of growth: *Lilium Martagon*, often 6 feet high, with fifty flowers; florists' *Delphiniums*, 10 feet high; *Veronica longifolia*, 7 feet high—all these continue fully fertile. For obvious reasons, early-flowering varieties are often fertile, and late-flowering forms barren in the same species; though, on the other hand, some plants flower continuously through summer, and only the latest flowers produce any seed. Of varieties of the same species, one may produce plenty of seed every summer, whilst another is persistently seedless.

Two well-known garden plants, supposed to be luxuriant developments produced by cultivation, but both of them of obscure history, may seem to favour the belief that luxuriance tends to sterility; for I have tried in vain for many years, both in my own garden and in others, to find a seed on either of them. One is called *Helianthus multiflorus*; it exists in several forms, both single and double, and is said to belong to the species *H. decapetalus*. The other is a beautiful and very robust herbaceous *Veronica*, the best of its class in cultivation. It is reported to have come from Japanese gardens, and is referred by

botanists to *V. longifolia*, being called in nurseries *V. l. subsessilis*.

It will be inferred from what I have said that internal evidence of the hybrid origin of a plant founded upon its sterility is likely to mislead. Some plants which succeed well in cultivation, and do not seem to have varied their type, never make a seed in my garden. *Malva Munroana*, which flowers all through summer, is one of these; *Centaurea glastifolia* (syn. *C. Biebersteini*) is another; though *C. macrocephala*, which is a native of the same region and flowers at the same time, having a strong general resemblance to it, ripens seed plentifully every year.

(5) The change which produces double flowers is the last I have to notice; and whatever doubt there may be whether cultivation alone, apart from selection and crossing, causes change of colour, I think there can be no doubt that it has a tendency to make flowers come double. I am not going to discuss the causes of doubling, which are no doubt very different in different plants; I will only say that it does not seem to come from luxuriant growth, or double flowers would come more frequently in my garden than they do. Every hardy plant which produces seed, or of which I can obtain seed, I have raised over and over again from seed, but have rarely raised a double seedling except from a source in which doubles would be expected. Composites, such as Michaelmas Daisies and perennial Sunflowers, often show an inclination to become double, but the seedlings from these semi-double individuals advance no further, whilst double Primroses and double Daffodils often revert to a perfectly single form. Poppies, such as *P. umbrosum*, and *P. alpinum* in all its colours, sometimes come double after several generations of all single flowers. Columbines, though I carefully exclude and destroy all doubles, persist in producing double seedlings, even in the hybrids as they approach the type of *A. vulgaris*. Florists' Delphiniums, *Anemone coronaria*, and the garden forms of *Papaver Rhœas* continue to produce double flowers from the seed of single, even in the cold soil of Edge garden, but these three plants were probably not introduced there from a genuine single stock.

Summary of deductions under the five divisions of the subject:—

(1) That individual wild plants when brought into cultivation

in a fit climate generally increase in stature and luxuriance, but often deteriorate in flower.

(2) That colour is as constant in cultivation as in nature, and that the great variations we see are for the most part due to selection and crossing.

(3) That in some cases plants belonging to different countries, and separated into different species by botanists, combine and continue fertile when grown together in gardens. But in the cases of hybridisation of distinct species, the hybrids generally are either barren and so die out, unless continued by cultivation, or they are fertilised by the pollen of one of the parents, and the offspring are inconstant, and there is a tendency in such cases for the hybrid to revert gradually and be absorbed into the more robust parent.

(4) There is no evidence that luxuriance in cultivation tends to cause sterility; but where we find an entirely barren garden flower which seems to be a good species, the sterility is due either to accidents of climate or perhaps to the inversion of the species by hybridising, the pollen-parent having been simply reproduced in an improved form by the seed-parent.

(5) The causes which produce double flowers are various and ill-defined, but are generally favoured by a warm soil and climate.

MICHAELMAS DAISIES.

By Mr. DANIEL DEWAR.

[Read October 4, 1892.]

Two years ago I was invited by the Council of the Royal Horticultural Society to act with the sub-committee which had undertaken to examine and correctly name the collection of cultivated Asters (Michaelmas Daisies) brought together at Chiswick, and the outcome—although our labours are by no means finished—is this short paper on the Michaelmas Daisies of our gardens. Coming so soon after the great Conference on Asters and Sun-flowers, which took place at Chiswick last year, I am afraid that very little can be added to what was then said on the subject, until at least our work at the Gardens has come to a definite

conclusion, and if I can keep your interest fresh until that time I shall feel amply rewarded.

The collection of these beautiful autumn flowers now at Chiswick is by far the finest I have ever seen brought together in any one garden. They have been gathered from all the known sources in Great Britain, and as far as possible, to facilitate the naming, the English forms have been planted side by side with a series of presumably wild or authenticated types. These latter are from Kew, and from the Harvard Botanic Gardens in America, long the headquarters of the veteran botanist Dr. Asa Gray. Ample material has been collected to show the great advance effected by cultivation; some of the forms, indeed, have been so far improved that there is nothing quite like them among the wild types. A few of the American group, as you are aware, are better known under cultivation than in a wild state, notably *A. versicolor*, *A. patulus*, *A. diffusus* var. *horizontalis*, and *A. lævigatus* (which last you will know better as *A. longifolius formosus*). Of all these we are told there are few, if any, authenticated wild specimens existing; and, however distinct these may be now, there is little difficulty, in the presence of so much decided variation, in believing that, in the days gone by, they have been manipulated by the gardener from the raw material, the identification of which we will leave to the botanist. We have come to a similar conclusion with several plants that have been growing in the Chiswick Gardens since the old days of hardy flowers, and especially with one called *A. eminens*. I have not the slightest idea as to which species it should be placed under. It is, however, a beautiful dwarf bushy form, and will certainly be a favourite rock-plant.

The late Dr. Asa Gray made a life-study of the genus *Aster*, and although he had all the wild American species at his fingers' ends, he was very much puzzled and troubled with the forms he found in English gardens; he named and renamed a particular plant a dozen times before he was finally satisfied as to its identity. Most genera that have been long cultivated in gardens are a source of great trouble to the systematist. Confusion arises from even the slight changes that take place under cultivation; but when we begin raising these cultivated forms from seed, selecting as we do the forms that tend to vary in a particular direction, we are making the work of the botanist a very trouble-

some one indeed ; the more so, as we invariably destroy the intermediate steps that have led up to our most advanced forms.

The number of species of Aster known to botanists may be roundly estimated at something like 250, and of these no less than 130 or 140 inhabit the United States of America, which may be taken as the great headquarters of the genus. It is also well represented in temperate Asia, Siberia, China, Japan, the temperate Himalayas, and throughout Europe, while outlying members are found in South America and Australia, and even Natal and Cape Colony. From the eastern United States come the greater number of our cultivated species, and, although perfectly distinct in character, comparatively few of the Rocky Mountain or other western types are found in English gardens.

There are also at present a large number of plants loosely called Michaelmas Daisies—not, indeed, without some show of reason—and which are said to belong to entirely distinct genera. Among these the Erigerons may be taken as typical. The difference between this genus and Aster is a very arbitrary one, and is based chiefly on the greater number of ligules or ray-florets, a distinction which good cultivation and the careful selection of the fullest new seedling Asters is making every year more arbitrary still. Boltonia, which now includes some of the old genus Calimeris, differs from Aster chiefly by its short almost paleaceous pappus, and Felicia and Olearia by their more or less shrubby habit.

The genus as a whole wants thorough and careful revision, and whoever may be prevailed upon to undertake it will have to begin by admitting that Asters hybridise as freely as the Columbine and the Larkspur. If the late Dr. Asa Gray could have admitted that these plants hybridise in cultivation, if not in a wild state as well, he would have spared himself much unnecessary worry. *A. laevis*, *A. Novi-Belgii*, *A. paniculatus*, and *A. longifolius* are the four species that are giving us almost all the trouble at Chiswick. Considerably over one-third of the Asters cultivated in our gardens I have no hesitation in saying are distinct garden crosses between *A. laevis* and *A. Novi-Belgii*. The plants we speak of are almost intermediate between the two ; the foliaceous involucreal tips of *A. laevis* are nearly always present, but, instead of being closely adpressed as in the type, they are often somewhat loose, and always narrower, as in

A. Novi-Belgii. A new hybrid of a very interesting nature was shown here a fortnight ago by the Rev. C. Wolley Dod, who has since kindly sent me specimens for a more leisurely examination. The parents were *A. Thomsoni* and *A. Amellus*. The flowers, the involucral bracts, and the upper leaves of the hybrid are distinctly *A. Amellus*, but the lower leaves I should say certainly partake of *A. Thomsoni*, minus the very distinct teeth.

The Committee are now engaged in drawing up popular descriptions of the varieties they have selected and named (see page 238), and a very remarkable point in these hybrids or varieties is the distinctive and presumably constant characteristic given to them by their (1) green or purple stems; (2) a narrow or a broad, an adpressed or a squarrose involucre; (3) a strict or compact habit, and also (4) height and (5) time of flowering.

All hardy flowers that in any way help to draw the autumn and spring together ought to be carefully encouraged. The Michaelmas Daisy in a great measure does this, and to my mind there is no more beautiful or graceful flower in the whole of the huge order Compositæ. Their high decorative value in the autumn garden has long been recognised by all lovers of outdoor gardening, and, associated as they usually are with Golden-rods and late Sunflowers, they form a noble and very interesting aspect of vegetation. Their habit and characters are varied enough for all the purposes of the flower-garden, and from the tallest of the *Novæ-Angliæ*, towering up to 8 or 10 feet high, to the tiny *A. Stracheyi* of the Himalayas, only rising an inch or so above the ground, we have almost every intermediate gradation in height and habit.

Asters might be very effectively used as bedding plants, such species as *alpinus*, *acris*, and *Amellus* being extremely free, beautiful, and of fine compact habit. Long after the Dahlia and the Japanese Windflowers have been withered by the early frosts, we are cheered by the bright starry blossoms of the Michaelmas Daisy, which in open seasons often carry us well into November. By the woodland walk in the grey autumn afternoon few plants look more lovely or are more in touch with the surrounding vegetation; their often stately, but generally gracefully arching, flower-branches give them a character quite their own; and as they are well able to take care of themselves, they give the cultivator only a minimum of trouble.

Why should not our dull clumps of Rhododendrons and other spring-flowering shrubs be enlivened in autumn with the sparkling starry blossoms of these Asters? All that is required is a thinning out of the shrubs, filling up the spaces with Asters and other autumn flowers. Such a clump might be made a beautiful flower-bed from March till November, with the advantage of never requiring any time to be spent in staking or tying, as is necessary when the plants are grown in a mixed bed or border.

The Michaelmas Daisies of our beds and borders require good and careful cultivation if we are going to make the most of them. They like a strong, deep, well-manured soil, and as a rule are better for annual division. Those growing in the woods and shrubbery-borders have plenty of room to develop, and are not so liable to form dense mats as those in the flower-border, which have to be constantly kept from encroaching on other things. The outside growths of all the running sorts (and these include most of the American species), which are always the strongest and best-rooted, should be taken for replanting, and the middle, where the growths have become congested, well broken up or thrown away. This will be best done in spring just as growth is commencing. All the Asters are easily increased from cuttings of the young shoots in spring, and as these are always plentiful a copious thinning will do good. Seed-raising is also very interesting, especially if they have been crossed, and it is by this means that most or all of our really good garden Asters have been obtained.

Some few of the Michaelmas Daisies are well worthy of isolated cultivation—that is, in beds formed of only one species. *Cordifolius* “Diana,” *paniculatus* “W. J. Grant,” *Lindleyanus* and *arcturus*, and other tall sorts, when grown in open spaces, produce abundance of lateral branches, which flower almost to the ground, and suggest summer clouds rather than bunches of flowers.

To make selections of Michaelmas Daisies suitable to all gardens and all positions would be a matter of no small difficulty, and I would suggest that those interested in the genus should go to Chiswick and there see for themselves, and then make their own selections.

I propose now to give a short review of the genus, and to indicate the species calling for special attention, either from their

showy flowers and suitability for the border, or for their dwarf or compact habit, making them of special value as rock-plants.

Although there are but few species found in Europe, yet these are most of them greatly valued for the rockery or small flower-beds. Most of them belong to the section *Galatella*, under which generic name they were all originally described. First and foremost comes *A. acris*, an extremely variable, and in its best forms one of the most beautiful of the early dwarf Asters. It includes *dracunculoides*, *hyssopifolius*, *punctatus*, and *linifolius*. It varies in height from 3 inches to 3 feet, the taller forms being the showiest and most useful border subjects.

A. canus is a nearly allied species, and differs chiefly in its shorter and broader distinctly 3-nerved leaves and paler flowers. *A. dahuricus*, also a good species, has much larger flowers than *A. acris*, a larger involucre, and rich lilac florets. It extends to Central Siberia. *A. Linosyris* "Goldielocks," of which there are several forms, some with and others without ray-florets, is a distinct and attractive plant, and will certainly come in the first thirty garden Asters.

Of Aster proper there are nine species found in the old world, the well-known *A. pyrenæus* being perhaps the rarest. It is a beautiful early, free-flowering plant, and will be found useful for the rockery. Another well-known species for a similar purpose is *A. alpinus*, charming in its best forms, dwarf and free, and a good doer. We next come to the most handsome of the European Asters, *A. Amellus*. It is widely spread through Central and Eastern Europe to Armenia and the Caucasus. It is a valuable garden-plant, of good compact habit, free flowering, and very variable, both in size and colour of flowers. The Committee have selected four forms for naming: *bessarabicus*, *amelloides*, *major*, and *cassubicus*. *Ibericus* is given in "Flora Orientalis" as a variety with more pubescent stems and smaller flowers. This species is very nearly allied to the Western Himalayan *pseudo-Amellus* and the temperate Asian *A. Maackii*, both of which are in cultivation at Kew. *A. sibiricus* stretches in its geographical distribution from Lapland through Siberia to Arctic America, and south to the Rocky Mountains. Amongst the first Asters to flower is a dwarf showy species that would make a good rock-plant, the North American *A. radula*; *A. radulinus* is very nearly allied to it. *A. salignus* is suspiciously near to dwarf

forms of *Novi-Belgii*; it was, or still is, found in Perthshire and Cambridgeshire, and in Southern Europe generally. It is probably an escape from gardens, and is very likely only an early form of *A. Novi-Belgii*. *Aster Bellidiastrum* is the last of the European species worth noting. It is common all over the Continent in alpine and sub-alpine districts, always in moist spots, and so plentiful in some of the Swiss passes that it quite takes up the place of our English Daisy. When well grown it is a very lovely plant, with its large rosy-tipped flowers and neat dwarf habit.

From the Himalayas we have many showy species, the best of which is perhaps the lately introduced *A. diplostephioides*. It is confined to the alpine region from Kashmir eastward to Sikkim. It forms dwarf tufts of narrow glutinous leaves, from which come long naked stems, bearing large solitary flowers of the most exquisite beauty. They are 4 inches in diameter, rich lilac with a bright golden disc. *A. molliusculus* is nearly allied to the American *A. nemoralis*, and *Heterochaeta tibeticus*, and *Laka* to the European *alpinus*. *A. Thomsoni*, from the temperate region of the Western Himalayas, is the *Calimeris flexuosa* of Royle, and is one of the most beautiful of the dwarf autumn Asters. It forms a useful rock-plant, flowering from July until November. It is nearly allied to, if not identical with, *A. asperulus*, which is kept up as a distinct species in the "Flora of British India." It does not stand dividing well, and should be increased from cuttings in spring, or raised from seed. *A. Stracheyi*, from an altitude of from 12,000 to 13,000 feet on the Western Himalayas, is a gem amongst Asters. It rarely exceeds a couple of inches in height, sending out runners or stolons from the original stock like a Strawberry, and these rooting as they go along, form an easy means of increase. The flowers are small but numerous, and of a bluish purple colour. It is a useful rock-plant in shady bays. *A. trinervius*, a variable and widely distributed species, is bright and showy; a variety called *compacta* comes from Japan. *A. tricephalus*, a good dwarf early-flowering species, is also in cultivation at Kew.

Of the Chinese and Japanese species only four are in cultivation—*A. tataricus*, which is so late that it rarely opens its flowers; *A. trinervius*, which is also common to the Himalayas; *A. Maackii*; and *A. scaber*, a beautiful bold white-flowered

species long cultivated in gardens as *Diplostegium discolor*. Very few also of the temperate Asian species are in gardens now. *Haupti*, *altaicus*, and may be *cabulicus*, are the only species we possess, and none of them are worth a place among garden-flowers.

We now come to the North American species, which include over two-thirds of the most ornamental Asters in cultivation. They are derived from something less than twenty species, and by far the greater number of them may be traced to *Novi-Belgii* and *lævis*.

The section *Biotia* includes *macrophyllus* and *corymbosus*, both useful, free-flowering plants.

Section *Doellingeria* takes in *umbellatus* and *cornifolius*, the former a bold, showy, white-flowered species (a splendid clump of a good variety of it is now in flower at Chiswick).

Ianthe takes in the dwarf *linariifolius*, a typical rock-plant, free-flowering, and of good bushy habit.

Orthomeris includes *ptarmicoides*, a dwarf plant with white flowers; *acuminatus*, with broad leaves and pink-tinged flowers; *nemoralis*, one of the prettiest of the section in the Kew collection; *glaucus*; and *tenuifolius*, which is a graceful, free-branching species, very leafy, and with innumerable white starry flowers.

Machæranthera takes in the handsome annual *tanacetifolius*, the biennial *gymnocephalus*, and the beautiful *Bigelovii*. This latter, which was figured in the *Botanical Magazine*, tab. 6430, as *A. Townshendii*, is a very handsome, easily cultivated plant. It is biennial, growing from 2 to 3 feet high, with large, massive heads of bright lilac-purple flowers.

Erigerastrum includes the dwarf *A. peregrinus* of the Arctic coast.

Aster proper takes in all the species with which we are most concerned at present. Out of eighty species and varieties belonging to this section, no less than fifty are in cultivation; and although many of these could be well dispensed with, the majority of them are distinct enough for most purposes, and variable enough in habit, in height, and in size and colour of flowers to suit the taste of the most fastidious cultivator. From the huge *Novæ-Angliæ* to the tiny *Reersii* we have in this section alone every gradation possible; and in flowers, from the

clouds of *cordifolius* "Diana" to the bold blue stars of "Robert Parker," every form and shade of blue and purple.

As I have already stated, most of the truly garden forms are hybrids between *lævis* and *Novi-Belgii*, and after much examination we find it most difficult—nay, almost impossible—to draw the line between the two species. Something will have to be done with these hybrids, and in my opinion the best way out of the difficulty will be to coin a garden name that will include all of them. They are garden creations, and should be indicated by a garden name. A good many varieties, on the other hand, of which "Robert Parker" in particular may be taken as the type, are clearly *Novi-Belgii*, and may be included as garden forms of that species. All the members of the *cordifolius* group, including *Shortii*, *Drummondii*, *Lindleyanus*, *undulatus*, and *sagittifolius*, are useful garden Asters, and are capable of much improvement. *Ericoides* and its variety *Reevesii* are rock-plants of great beauty, and should always be associated with *dumosus* and *sericeus*. *A. diffusus* may well be dispensed with, but its varieties *horizontalis* and *pendulus* merit a prominent place either in the flower-border or rockery. *Vimineus* is also a good species, free, much branched, and of a graceful but compact habit. *Surculosus*, *Herveyi*, and *spectabilis* are all of the *Amellus* type; and the latter, if it can be had in flower late enough, we would suggest as a good cross with *Novi-Belgii* or *lævis*. *Grandiflorus* stands alone as a distinct and beautiful Aster, but it is only in the south and in good seasons that the flowers are fully developed before the autumn frosts set in. *Polyphyllus* has been eclipsed by the beautiful seedling "John Wood"; and *amethystinus* can well be spared in presence of the grand *Novæ-Angliæ pulchellus*. This latter species, with its *roseus*, *ruber*, and *pulchellus* forms, makes a unique group in the autumn garden, bold and massive, and constitute with "Robert Parker" and *puniceus pulcherrimus* most suitable plants for the shrubbery or back lines of the flower-border. Typical *versicolor* is a very dwarf and pretty plant, known in gardens long ago as *discolor* and *discolor major*; the *versicolor* of gardens, a tall plant with white and pink flowers, is now known as "Janus." *A. patens* and *turbinellus* are remarkable in habit, but they are only second-rate as garden-plants, and *paniculatus*, which is very prolific in varieties, is quite an outsider. *Multiflorus* is a very free white-

flowered species, but it has a faulty habit; and *Tradescantii* is only worth a place in the wood in company with *tardiflorus*, *patulus* and *prenanthoides*.

I refrain from saying much about the garden forms now under consideration at Chiswick until our labours are fully concluded, because many of the names may still be altered, so that it would only cause confusion—a state of things, in this genus especially, which we want to avoid as far as possible. The result of our work at the Chiswick Gardens will shortly be published in the *Journal*, and as a set of the named sorts will always be grown there, it will be a ready source of reference to all interested in his the most beautiful of hardy autumn-flowering plants.

REPORT ON ASTERS,

MOSTLY KNOWN AS MICHAELMAS DAISIES.

Prepared by Mr. D. DEWAR.

THE following is believed to be a complete list of the species of Aster in cultivation in English gardens at the present time. Most of them will be found in the Society's gardens at Chiswick, and the remainder, a few of which are only of botanical interest, will be found at Kew, where the collection, both of species and varieties, is nearly complete. The work of the Chiswick Aster Committee, which has extended over two years, has been very complicated, entailing much time and no little patience. The work is now, however, practically finished, and a collection of the Asters named by the Committee is being grown at Chiswick, both as a means of reference and also to distribute amongst the Fellows, or those of them who are interested in these late-flowering hardy plants. The heights given in feet are not to be absolutely relied upon, as they varied considerably during the two years the plants were under observation. Newly planted Asters are likely to grow taller than established clumps, and the nature of the soil and the season must also be taken into consideration. The time of flowering also varied somewhat, but not enough to call for special remark.

A reference to the list will show that the majority of the garden forms have been referred to *A. lævis* and *A. Novi-Belgii*

in about equal proportions. This could not possibly be avoided, as a large number of these strictly garden Asters are most certainly hybrids between *A. lævis* and (probably) *A. Novi-Belgii*, with much more, however, of the former than of the latter blood in them. The list is as complete as it was possible to make it this year, only some few new varieties, on which the Committee would not pronounce a decided opinion as yet, being omitted.

LIST OF SPECIES AND GARDEN FORMS.

In the following list, **X X X** attached to the name of any plant indicates "Highly commended," and **X X** "Commended." The date following indicates roughly the time of best bloom.

1. *ASTER ACRIS*, L., Europe.
 - a. var. *dracunculoides* :—a tall free-flowered form.
 - b. var. *nanus* :—very dwarf, useful for rockeries.
2. *A. ACUMINATUS*, Michx., North America.
3. *A. ALPINUS*, L., Europe, &c.
 - a. var. *albus* :—white-flowered.
 - b. var. *roseus* :—rose-coloured flowers.
 - c. var. *speciosus*, hort. :—more robust and larger flowered than the type.
4. *A. AMELLUS*, L., Europe.
 - a. var. *amelloides* :—bushy, 2 feet in height ; flowers dark lilac-purple, 2-2½ inches in diameter.
X X X, September 6th.
 - b. var. *bessarabicus* :—flowers 2-2½ inches in diameter, rich lilac-purple ; height 2 feet.
X X X, August 24th.
 - c. var. *major* :—flowers large, rich violet-purple ; the tallest of the *Amellus* varieties.
5. *A. AMETHYSTINUS*, Nutt., North America.
6. *A. BELLIDIASTRUM*, Cass, Europe.
7. *A. CABULICUS*, Lal., Cabul.
8. *A. CANUS*, W. and K., Europe.
9. *A. CAROLINIANUS*, Walt., North America.
10. *A. CORDIFOLIUS*, L., North America.
 - a. var. *Diana* (syn. *Photograph*) :—erect bushy habit ; flowers crowded, small, very pale lilac ; height 4 feet.
X X X, October 4th.
 - b. var. *Albula* :—erect, spreading ; flowers numerous, crowded, small, lilac and white ; height 4 feet.
X X X, September 10th.
 - c. var. *elegans* (syn. *undulatus*, hort.) :—erect, bushy ; flowers small, bright lilac ; height 4 feet.
X X X, September 18th.

11. *A. CORYMBOSUS*, Ait., North America.
 - a. var. *Perseus* :—heads bushy ; flowers numerous, starry, white, $\frac{3}{4}$ –1 inch in diameter ; height $2\frac{1}{2}$ feet.
X X, August 23rd.
12. *A. CURTISII*, T. and G., North America.
13. *A. DAHURICUS*, Benth., Dahuria.
14. *A. DIFFUSUS*, Ait., North America.
 - a. var. *horizontalis* :—dwarf, dense bushy habit, branching horizontally ; flowers red and white ; height 2 feet.
X X X, October 2nd.
 - b. var. *pendulus* (syn. *Nondescript*) :—stems tall, arching ; flowers white, $\frac{1}{2}$ – $\frac{3}{4}$ inch in diameter ; height 3 feet.
X X, October 3rd.
15. *A. DIPLOSTEPHIOIDES*, Wall., Himalayas.
16. *A. DOUGLASII*, Ldl., North America.
17. *A. DRUMMONDI*, Ldl., North America.
 - a. var. *Cora* :—habit erect ; flowers numerous, $\frac{1}{2}$ inch in diameter, pale pinkish, rays reflexed ; height $5\frac{1}{2}$ feet.
X X, September 24th.
18. *A. DUMOSUS*, L., North America.
19. *A. ERICOIDES*, L., North America.
 - a. var. *Olio* :—very bushy ; leaves all linear ; flowers numerous, $\frac{3}{4}$ inch in diameter, pale pink ; height $2\frac{1}{2}$ feet.
X X, September 23rd.
20. *A. GLAUCUS*, T. and G., North America.
21. *A. GRANDIFLORUS*, L., North America.
22. *A. HERVEYI*, Gray, North America.
23. *A. JUNCEUS*, Ait., North America.
24. *A. LAEVIS*, L., North America.
 - a. var. *Apollo* :—sparingly branched ; leaves broadly lanceolate, toothed ; stems purplish ; flowers numerous, deep lilac, $1\frac{1}{2}$ inch in diameter, height 5 feet.
X X X, August 23rd.
 - b. var. *Arachne* :—tall, with dense heads ; flowers numerous, $1\frac{1}{2}$ –2 inches in diameter, lilac, slightly cup-shaped ; leaves broad, lanceolate, clasping the stem ; involucre leafy, spreading ; height 4 feet.
X X X, August 4th.
 - c. var. *arcturus* :—near var. *Apollo*, but having black stems, and deep rosy-lilac flowers ; height 4 feet.
X X X, August 20th.
 - d. var. *Ariadne* :—bushy, leafy ; leaves lanceolate, acuminate ; stems purple ; flowers $1\frac{1}{2}$ inch in diameter, deep lilac-purple, full ; height $5\frac{1}{2}$ feet.
X X X, September 24th.

24. *A. LEVIS*—continued.

- e. var. Calliope* :—bushy, spreading habit, very leafy quite to the top ; leaves lanceolate, entire ; flowers $1\frac{1}{2}$ inch in diameter, lilac-purple ; height 5 feet.

X X X, October 4th.

- f. var. decorus* :—bushy ; near to *A. N.-B. var. densus*, but with paler pinkish-tinged flowers ; height $3\frac{1}{2}$ feet.

X X X, September 8th.

- g. var. Flora* :—good free habit ; flowers $1-1\frac{1}{2}$ inch in diameter, rich lilac ; height 5 feet.

X X, October 2nd.

- h. var. floribundus* :—sparingly branched ; leaves lanceolate, narrow ; flowers $1-1\frac{1}{2}$ inch in diameter, dark rosy-purple ; stems purple ; height $4\frac{1}{2}$ feet.

X X X, September 24th.

- i. var. formosissimus* :—slender ; leaves broad, lanceolate ; flowers $1\frac{1}{2}$ inch in diameter, very full, deep rosy-lilac ; height $4\frac{1}{2}$ feet.

X X, September 26th.

- k. var. Harvard* :—loose spreading habit ; leaves broad, lanceolate ; stems green ; flowers $1-1\frac{1}{2}$ inch in diameter, deep rosy-lilac ; involucre adpressed ; height 5 feet.

X X X, September 4th.

- l. var. Horace* :—leafy ; leaves broad, lanceolate ; involucre bracts with broad tips, adpressed ; flowers 1 inch in diameter, deep lilac ; height 4 feet.

X X, September 18th.

- m. var. Juno* :—leafy, bushy, tall ; leaves short, broadly lanceolate, dark green ; flowers $1-1\frac{1}{2}$ inch in diameter, rich purple ; height 5 feet.

X X, September 28th.

- n. var. Noir d'Angen* :—bushy, very leafy ; leaves broad, oval, lanceolate ; flowers 1-2 inches in diameter, full, round, lilac ; stems purplish ; height 4 feet.

X X, September 6th.

- o. var. Pluto* :—habit like that of *var. Juno* ; flowers smaller, paler, very round and full ; involucre bracts broader at the tips ; height 4 feet.

X X, September 28th.

- p. var. Psyche* :—bushy, leafy ; leaves broad, lanceolate ; flowers lilac, very full, $1-1\frac{1}{2}$ inch in diameter ; height $3\frac{1}{2}$ feet.

X X, August 23rd.

- q. var. Pygmalion* :—very dwarf, with dense habit ; leafy ; leaves lanceolate, clasping ; stems green ; flowers numerous,

24. *A. LÆVIS*—continued.

1-1½ inch in diameter, bright lilac, cup-shaped ; height 2 feet.

XXX, August 6th.

r. var. *Taurus* :—bushy ; stems green ; leaves ovate-lanceolate ; flowers very pale rose-purple, 1½ inch in diameter ; involucre adpressed ; height 4 feet.

XX, September 2nd.

s. var. *Vesta* :—bushy, leafy ; leaves lanceolate ; flowers 1-1½ inch in diameter, whitish ; height 3 feet.

XXX, September 3rd.

t. var. *Virgil* :—erect, not branched ; leaves lanceolate ; flowers 1-1½ inch in diameter, deep lilac-purple ; height 4 feet.

XXX, September 24th.

25. *A. LINARIFOLIUS*, L., North America.26. *A. LINDLEYANUS*, T. and G., North America.

a. var. *nanus* :—a dwarf form 1½ foot high, with deep lilac flowers.

XX, September 13th. A good rock-plant.

27. *A. LINOSYRIS*, Bernh. (syn. *linarioides*), Europe.

a. var. *ligulatus*, in which the white ray-florets are present ; not so good as the type.

28. *A. LONGIFOLIUS*, Lam., North America.29. *A. MAACKII*, Regel, China, &c.30. *A. MACROPHYLLUS*, L., North America.31. *A. MULTIFLORUS*, Ait., North America.32. *A. NEMORALIS*, Ait., North America.33. *A. NOVÆ-ANGLIÆ*, L., North America.

a. var. *pulchellus* :—flowers large, deep violet.

XXX, September 27th.

b. var. *præcox* :—flowers large, purple.

XXX, early in August.

c. var. *roseus* :—flowers pale rose.

XXX, September 27th.

d. var. *ruber* :—flowers rich deep rose.

XXX, September 20th.

34. *A. NOVI-BELGII*, L., North America.

a. var. *Albion* :—dense bushy habit ; flowers 1 inch in diameter, white, starry ; leaves narrow, lanceolate ; height 5 feet.

XX, August 9th.

b. var. *Archer Hind* :—bushy, leafy ; leaves broad, lanceolate ; flowers numerous, starry, 1-2 inches in diameter, pale rosy-lilac ; height 4 feet.

XXX, August 26th.

c. var. *Argus* :—bushy, very leafy ; leaves narrow, lanceolate,

34. *A. NOVI-BELGII*—continued.

toothed ; stems deep purple ; involucre bracts narrow, spreading ; flowers pale lilac-purple, 1-1½ inch in diameter ; height 4½ feet.

XX, August 8th.

- d. var. *Aurora* :—bushy ; stems purplish ; flowers not crowded, large, lilac-purple, 1-1½ inch in diameter ; involucre small, slightly spreading ; height 3½ feet.

XXX, August 10th.

- e. var. *Berenice* :—dense bushy habit, leafy ; leaves linear-lanceolate, upper very narrow ; flowers 1½ inch in diameter, numerous, lilac-purple ; stems purple ; height 5 feet.

XXX, October 6th.

- f. var. *Catulus* :—a dwarf form nearly allied to var. *Janus* ; flowers ¾ inch in diameter, white shading to lilac ; height 3 feet.

XX, September 8th.

- g. var. *Ceres* :—a small-flowered form of var. *Purity*.

XX, September 1st.

- h. var. *densus* (syn. *J. Dickson*) :—bushy ; leaves broadly lanceolate ; flowers very numerous, lilac-purple, 1-1½ inch in diameter ; height 3½ feet.

XXX, September 8th.

- i. var. *discolor* (syn. *discolor seedling*) :—similar to var. *Janus*, but dwarfer, with white and pale lilac flowers.

XX, September 13th.

- k. var. *Fanny* :—habit bushy ; flowers 1-1½ inch in diameter, bright lilac ; height 3½ feet.

XX, September 3rd.

- l. var. *Fortuna* :—bushy, leafy ; leaves linear-lanceolate ; flowers very full, pale lilac, 1½ inch in diameter ; height 5½ feet.

XX, October 1st.

- m. var. *Harpur Crewe* :—tall, sparingly branched ; leaves broad, lanceolate ; stem clasping ; flowers 1-2 inches in diameter, white, tinged with rose when old ; height 4-5 feet.

XXX, August 3rd.

- n. var. *Janus* :—tall, sparingly branched ; flowers numerous, 1-1½ inch in diameter, white and rosy-purple ; leaves very narrow, the lower broadly lanceolate ; height 5½ feet.

XXX, August 20th.

- o. var. *Irene* :—near to var. *Fanny*, but taller, less bushy, and with darker flowers.

XX, September 3rd.

34. *A. NOVI-BELGII*—continued.

p. var. *John Wood* :—fine habit ; flowers large, white, cup-shaped, 1-1½ inch in diameter ; height 3 feet.

XXX, September 20th.

q. var. *lævigatus* (syn. *longifolius formosus*) :—dwarf, very bushy ; flowers numerous, deep rose, 1-1½ inch in diameter ; leaves narrow, lanceolate ; height 2½ feet.

XXX, August 26th.

r. var. *lilacina* :—bushy ; flowers numerous, pale lilac, 1-1½ inch in diameter ; involucre bracts broadish, spreading ; height 4 feet.

XX, August 5th.

s. var. *litoreus* :—bushy ; flowers numerous, white, 1 inch in diameter ; leaves ovate-lanceolate, toothed ; height 4 feet.

XX, August 15th.

t. var. *Minerva* :—bushy, branched ; stems purple ; flowers 1-1½ inch in diameter, numerous, deep rosy-lilac, full ; height 4½ feet.

XXX, October 4th.

u. var. *nanus* (syn. *hybridus*) :—a dwarf, small-flowered form of var. *lævigatus* ; flowers rose, starry.

XXX, September 4th.

v. var. *Proserpine* :—tall, bushy, leafy ; leaves narrow, lanceolate ; flowers 1-1½ inch in diameter, rosy-lilac ; involucre bracts narrow, spreading ; height 6 feet.

XXX, September 24th.

w. var. *Purity* :—near to var. *Harpur Crewe*, but taller and with a more pyramidal habit ; flowers 1-2 inches in diameter, white, rays slightly reflexing ; height 5½ feet.

XXX, August 6th.

x. var. *Ravennæ* :—tall, not much branched ; stems green ; leaves lanceolate, slightly toothed ; flowers, 1-1½ inch in diameter, rosy-lilac, crowded ; involucre narrow, adpressed ; height 4½ feet.

XXX, September 6th.

y. var. *Robert Parker* :—bushy ; leaves narrow, lanceolate, toothed ; flowers numerous, 1½-2 inches in diameter, lilac-purple, full ; height 5-6 feet.

XXX, September 15th.

z. var. *Scorpio* :—bushy, dense heads ; leaves ovate-lanceolate ; flowers numerous, crowded, full, pale lilac-purple, 1-1½ inch in diameter ; near to var. *densus*, but having black stems ; height 3½ feet.

XX, September 10th.

34. *A. NOVI-BELGII*—continued.

aa. var. *Stella* :—dwarf, bushy ; flowers rosy-lilac, 1-2 inches in diameter, rays narrow and distant ; height $2\frac{1}{2}$ feet.

XX, August 3rd.

bb. var. *Taurus* :—fine habit ; flowers numerous, crowded, pale lilac-purple, $1\frac{1}{2}$ inch in diameter ; height 4 feet.

XX, September 26th.

35. *A. PANICULATUS*, Lam. (syn. *carnea*), North America.

a. var. *blandus* :—dense bushy heads ; leaves lanceolate ; flowers $\frac{3}{4}$ inch in diameter, starry, white, shaded lilac ; height $4\frac{1}{2}$ feet.

XX, September 8th.

b. var. *Dot* :—bushy habit ; leaves lanceolate, toothed in the upper half ; flowers barely $\frac{3}{4}$ inch in diameter, white, tinged with rose ; height $3\frac{1}{2}$ feet.

XX, August 3rd.

c. var. *W. J. Grant* :—a graceful, free-branching form, with pale mauve flowers ; height $3\frac{1}{2}$ feet.

XXX, September 2nd.

36. *A. PATENS*, Ait., North America.37. *A. PATULUS*, Lam., North America.38. *A. PEREGRINUS*, Pursh., America, Asia.39. *A. POLYPHYLLUS*, Willd., North America.40. *A. PRENANTHOIDES*, Muhl., North America.41. *A. PTARMICOIDES*, T. and G., North America.42. *A. PUNICEUS*, L., North America :—flowers rosy-lilac ; height 4 feet.

XX, August 3rd.

a. var. *lucidulus*, Gray :—bushy, branched ; stems purple ; very leafy ; flowers $1\frac{1}{2}$ inch in diameter, pale lilac ; height $5\frac{1}{2}$ feet.

XXX, August 5th.

b. var. *pulcherrimus* :—bushy, spreading habit ; stems dark purple ; flowers white, tinged with lilac, rays reflexed ; height 5 feet.

XXX, September 9th.

43. *A. PYRENEUS*, DC., Pyrenees.44. *A. RADULA*, Ait., North America.45. *A. SAGITTIFOLIUS*, Willd., North America.46. *A. SALICIFOLIUS*, Ait., North America.47. *A. SERICEUS*, Vent., North America.48. *A. SCABER*, Thunb., China, &c.49. *A. SHORTII*, Hook., North America.50. *A. SIBIRICUS*, L., Europe, Siberia, &c.

51. *A. SIKKIMENSIS*, Hook., Himalayas.
 52. *A. SPECTABILIS*, Ait., North America.
 53. *A. STRACHEYI*, Hook. fil., Himalayas.
 54. *A. SURCULOSUS*, Michx., North America.
 55. *A. TARDIFLORUS*, L., North America.
 56. *A. TATARICUS*, L. fil., Orient, &c.
 57. *A. THOMSONI*, Clarke, Himalayas.
 58. *A. TRADESCANTII*, L., North America.
 59. *A. TRICEPHALUS*, Clarke, Himalayas.
 60. *A. TRINERVIS*, Desf., Europe.
 61. *A. TRINERVIUS*, Roxb., Himalayas.
 a. var. congesta :—a dwarf bushy form from China.
 62. *A. TURBINELLUS*, Ldl., North America.
 63. *A. UMBELLATUS*, Mill., North America.
 64. *A. UNDULATUS*, L. (syns. *squarrosus* and *Milleri*), North America.
 65. *A. VERSICOLOR*, Willd. (syn. *discolor minor*), North America :—
 dwarf, prostrate habit, 6-18 inches high ; leafy ; flowers
 1 inch in diameter, white to rose or rose-lilac.
 X X, September 26th.
 a. var. Antigone (syn. *discolor major*) :—taller and less bushy
 than the type ; height $3\frac{1}{2}$ feet.
 X X X, September 20th.
 b. var. Themis (syn. *discolor*) :—straggly habit ; $\frac{3}{4}$ bushy, leafy ;
 2- $2\frac{1}{2}$ feet high ; flowers same as in type.
 X X, September 21st.
 66. *A. VAHLII*, Hook. and Arn., Falkland Islands.
 67. *A. VIMINEUS*, Lam., North America :—habit bushy ; leaves
 narrow, linear ; flowers numerous, white, $\frac{1}{2}$ inch in
 diameter ; height $2\frac{1}{2}$ feet.
 X X, September 26th.
 a. var. Cassiope :—more bushy than the type ; flowers white
 and lilac, numerous, small ; height 3 feet.
 X X, September 2nd.
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CYCADS.

By Mr. W. CARRUTHERS, F.R.S.

[Read October 18, 1892.]

IN appearance cycadaceous plants resemble Palms, and are not unlike Tree-Ferns, but they are really related to the Pine family.

The earlier botanists could not make out what they were. Now we know that, associated with two other groups, they form a distinct division of flowering plants.

In the fertilisation of the plants we are most familiar with, the pollen-grain falls upon or is conveyed to the stigma, and then sends down a slender tube through the substance of the style until it reaches the ovule and fertilises it. Plants thus fertilised belong to the higher class of phanerogamous or flowering plants. In the Cycadeæ, however, the pollen-grain does not rest upon a stigma, nor pass through the substance of the style before reaching the ovule, but comes into direct contact with it. The ovule is not enclosed in a carpel, but is more or less freely open to the air; they are consequently called naked-seeded or gymnospermous plants. The group is a small one, containing not more than 400 species, which are distributed into three orders, viz. :—

(1) The Gnetaceæ, represented by *Gnetum Ephedra* and the marvellous *Welwitschia*—a huge vegetable baby which lives for a century or more, and produces only one pair of leaves after the cotyledonary ones.

(2) The second order is the Coniferæ, to which belong the Pines, Larches, Firs, Yews, &c. Coniferous plants are distributed over large tracts of the northern hemisphere, and are comparatively rare in the southern.

To-day I ask your attention to the third order, the Cycadeæ. But first let me say that gymnosperms are most important plants in the history of the vegetation of our globe. They form a part of the first dry-land flora with which we are acquainted, petrified fragments of their wood being preserved in rocks of Devonian or Old Red Sandstone age. In the carboniferous rocks many genera and species related to the Yews have been found. Some of them attained a great size. At the Natural History

Museum, South Kensington, there is a large trunk from the coal measures near Edinburgh. It was nearly 50 feet in length when I saw it in the quarry, but only about 20 feet of it were sufficiently entire to be erected in the grounds of the museum. It is $3\frac{1}{2}$ feet in diameter. The whole length in the quarry was the undivided trunk below the first branches. It is in such a good state of preservation that the coniferous structure is easily identified. Coniferæ are found all through the subsequent rocks, gradually showing the incoming of living genera. In the Secondary rocks numerous examples of Cycadeæ occur, beginning in the Lias with a trunk showing the characters of *Cycas*. In the Wealden are fruits like those of *Zamia*, and throughout the Upper Secondary strata are found the remains of an extinct group of Cycadeæ, to which the "Crows' nests" of Portland belong; they had fleshy fruits analogous to those of the Yew. *Araucaria* appears in the Lower Oolites; *Pinus* in the Upper Oolites; *Abies*, *Cedrus*, and *Sequoia* in the Cretaceous rocks; *Callitris* and other genera in the Tertiaries.

At present the Cycadeæ are chiefly confined to tropical regions, although some pass southwards—in Australia (*Macrozamia*), in Africa (*Encephalartos* and *Stangeria*); northwards in Japan (*Cycas revoluta*), and in the United States several species of *Zamia*. The species of *Cycas* are found in the countries and islands bordering the Indian Ocean, the headquarters being in the Malayan Archipelago, extending northwards through the Philippine Islands to Japan, westwards to India and Ceylon, southwards to the Comoro Islands, and perhaps Madagascar on the west, and to tropical Australia on the east. The fruit is borne on the edges of altered leaves which grow in the same series as the ordinary leaves, and when they fall off a lozenge-shaped scar is left, like to, but smaller, than that of the ordinary leaf. *Cycas* is the first known, and the best known, of the whole order, though new species are being continually added to the genera. The fruits in the other genera are borne in cones. In *Zamia* the seeds are produced on the inner surface of peltate, not imbricate scales, which are arranged in a linear series. *Zamia*, with the closely allied *Ceratozamia*, is found in the tropical regions of the New World, extending northwards into Florida and southward to Bolivia.

In the Old World we find Cycads more closely related to

Zamia than to *Cycas*. The genus *Encephalartos* is peculiar to Africa, chiefly in the south, but some species are found within the Tropics. In it the scales are peltate, and spirally arranged—not in a linear series, as in the New World genera.

In Australia we have *Macrozamia* with peltate scales also spirally arranged. The scales have a drawn-out apex, sometimes long enough to give an imbricated appearance to the cone.

Alongside of these plants, characteristic of the regions where they occur, there are remarkable aberrant genera. In Mexico we find *Dion*, with perhaps three species. It has flat imbricated scales in the cone. *Stangeria*, with its peculiar leaves and cones, is found at Natal, in the geographical region of *Encephalartos*; and *Bowenia*, with its bipinnate leaves, in North Australia, the country of *Macrozamia*.

The geographical distribution of the Cycadeæ is very interesting, and extremely puzzling—more so than any group of plants I know. The oldest group, like that found in the Lias, exists in the islands and countries around the Indian Ocean, and forms a very distinct subdivision of the order. The *Zamias*, in which I include all the Cycads with their fruits in cones, have one series represented by the genus *Zamia*, with the aberrant *Dion*, confined to America; a second series, represented by *Encephalartos*, with the aberrant *Stangeria*, in Southern Africa; and the third series, represented by *Macrozamia*, with the aberrant *Bowenia*, in Australia. It is difficult for me, in accordance with the generally accepted view of the origin of our existing vegetation, to imagine a common parent, of which no traces are known, which gave origin in the Lias to a representative of the existing genus *Cycas*, in the later Secondaries to the extinct *Mantellias*, and *Bennettites*, and the existing *Zamias*, and which has left well-marked and completely isolated genera peculiar to the great divisions of the globe which possess a tropical climate—America, Asia, Africa, and Australia. An order so well defined, with a few well-limited genera, and not more than a hundred species, supplies an advantageous group of plants to test theories of geographical distribution or evolution. I cordially commend it as a study to those engaged in such inquiries.

I cannot venture before this audience to add anything about the cultivation of these plants. As a rule they are not difficult to cultivate. They have great stems, in which a large quantity

of nourishment is stored, and this may remain unused for many months, or even years. I would, in closing, warn any grower of these plants not to throw away what may appear to be only a dead stem, for if left to itself it may, after years of inactivity, suddenly break forth into leaf, to the astonishment of the gardener, and for reasons only known to the plant itself, if I may say so.

DISCUSSION.

Dr. MASTERS remarked that one of the most extraordinary things about the Cycadeæ was that the plants which are now known are actually the same as those which existed when the world was very young. He ventured to say that if all the huge antediluvian animals, such as were represented at the Crystal Palace, and which at one time lived in the world, were now to be seen walking about, people would be considerably astonished, and yet these were but contemporaries of the same Cycadaceæ as at present exist.

From a cultural point of view, he was astonished that such magnificent ornamental plants, which were so easily grown, were not more generally to be met with in gardens.

Mr. W. WATSON said it was very true that, with one or two exceptions, cycadaceous plants might be easily grown. They should, however, all receive tropical treatment, notwithstanding the fact that *Cycas revoluta* would live, but not thrive, in a cool greenhouse. In reference to the lecturer's remark as to the stems retaining life for a very long time, Mr. Watson mentioned that some years ago Baron Mueller, of Melbourne, sent over a trunk of *Macrozamia Muelleri* to the Royal Gardens, Kew. For three years this trunk was kept in the Palm-house, but it exhibited no sign of life. The lower half of the stem was quite dead. This portion was cut off, and soon after the upper portion began to grow. The plant is now in a healthy condition, and possesses a fine head of leaves. Cycads sometimes lose their growing points, the central part rotting away; and under these circumstances the stem will sometimes produce lateral branches. They are thus quite different from Palms in this respect. It was not possible to get the seeds of Cycads to ripen in this country, because the pistillate (female) and staminate (male) plants do not flower at the same time, consequently the ovules could not be

fertilised. He believed, however, that a hybrid had been raised in the Botanic Gardens at Amsterdam. The cones sometimes change to a rich brown colour, and as the scales open, the bright red ovules within can be seen, and they form a very pretty sight.

FRUIT-TREES IN POTS.

By the Rev. W. WILKS, M.A., Sec. R.H.S.

[Read November 1, 1892.]

My lot having been cast in a garden absolutely destitute of walls, but blessed with such magnificent Holly hedges that it would be an actual sin to cut them down to make way for walls, a problem very soon presented itself, viz. How best, and at least cost, to grow Peaches, Nectarines, and late Pears?—and to these I may now add, some of the better Plums and Apricots.

As this is to be a thoroughly practical paper, I will first state what my exact aim was, and then go on to relate how I proceeded to carry it out, and the measure of success attained. And as I am writing only for the information of beginners like myself, I hope professional growers will kindly correct but not unkindly criticise my errors.

Having but a small household to cater for, my object was not to obtain a large supply of fruit at any one particular time of the year, but to be sure of having a little always, or during as many months as possible. I therefore at once gave up the idea of what is ordinarily known as a "Peach-house," where two or three trees at most are planted out in the border, and from which, as far as my information goes, you may by good cultivation obtain an immense quantity of large and excellent fruit, but for the most part confined to a single fortnight or three weeks in the year. I therefore determined to adopt some variety (for there are many) of the orchard-house system introduced years ago by Mr. Rivers, whose name is (or should be) as a household word to all growers and consumers of Peaches, Nectarines, Plums, and Pears.

And the first step I took was to pay a visit to Mr. Rivers at Sawbridgeworth, and also to Mr. Bunyard at Maidstone, who has adopted a modification of Mr. Rivers' system. I will not stop to

tell of what these two eminent growers showed me. Suffice it to say they showed me all they had to show, and the mere sight of it—let alone the good advice and useful hints they gave me—has been of the greatest possible service, and it is no exaggeration to say that to those two visits I attribute very much of the success with which I have been rewarded.

Returned from those visits with ample notes and laden memory, I at once began to design myself a house, which the village carpenter and bricklayer between them built under my own supervision. And as I attribute something to the house, I will venture to describe it, without for a moment saying that it is the best possible, much less the only possible, sort of structure in which to achieve success. The house is 48 feet long by 20 feet wide. The height is 12 feet in the centre to the ridge, and 6 feet at the sides. It runs east and west—this is from the necessities of the situation; but although most people prefer the length of a house to run north and south, yet I cannot help thinking that east and west secures a greater total amount of light, and it certainly presents the smallest possible surface to the east, which is the wind and aspect most injurious to the bloom. At either end are two large doors folding into the centre, so as to give ample height and width for the easy transport of the trees. There is a large swing light in the angle above each door. The 6-foot sides are composed of 2 feet of 9-inch brick and 4 feet of glass, and all the glass all round the house opens wide in the panels of the woodwork, thus securing an ample supply of fresh air and plenty of ventilation whatever wind may blow. The rafters are $15\frac{1}{2}$ inches apart and continuous from ridge to eave, and glazed with large sheets of glass, and thus the two great requirements of light and air (or ventilation) are abundantly secured.

The question of heating or not heating was discussed, and arguments both for and against carefully considered, with the result that a 4-inch flow and return runs on both sides and across the east end of the house. Two considerations chiefly led to this, viz. the protection of the blossoms of the trees from frosts in March and the utilisation of the house in winter for Chrysanthemums and other suchlike purposes. The floor is simply made up all over of ashes beaten and rolled very hard.

So much for the house. Now for the outline of a year's

work. And first let me say that, except special mention of any difference is made, we treat Peaches, Nectarines, Plums, and Pears alike. Of Apricots I have only the record of utter failure to make.

The year's work begins with the preparation of the compost in September. It is composed of the following ingredients, of course thoroughly well mixed together, and allowed to lie a month afterwards before using, under cover from heavy rain, but otherwise the more open to the air the better :—

5 barrow-loads of fat yellow loam.

1 „ „ leaf soil.

1 „ „ well-rotted but not worn-out dung.

1 „ „ drift sand.

1 „ „ old mortar rubbish.

1 bushel of $\frac{1}{4}$ -inch bones.

2 gallons of bone meal.

1 „ Clay's Fertiliser.

1 „ Thomson's Vine Manure.

Some will think the use of so many ingredients fanciful, but as I am writing history I must e'en relate the fads and fancies of our annual practice.

Every tree is repotted in this compost every year.

Towards the middle or end of October we start potting. The trees are not watered for two or three days previously, so that the old soil may come away from the roots more easily. A strip of board is placed across a barrow; a tree is lifted out of its pot; the "crops" are loosened with the hand and fall back into the old pot, and both crops and pot are carried off by a boy to be washed; the ball of soil matted with the roots is then lifted on to the board; the operator stands between the handles of the barrow with the head of the tree turned from him, which thus has free room, and the bloom-buds are in less danger of being thinned. The gardener holds the stem of the tree in his left hand, and with his right works a short pointed stick in and out amongst the roots, loosening the soil as much as possible and giving an occasional shake. The old soil falls into the barrow, and, as it is still far from exhausted, is kept for various purposes, such as repotting evergreen shrubs for the winter-garden, &c., &c. The pointed stick should be worked carefully, so that not a single root be broken, or even bruised if possible. When all the soil that

can be got out has been removed, we go over the remaining ball with a sharp knife, cutting right back all woody and all long fleshy and wiry roots, but leaving all the small fibrous roots. Amateurs are far more likely to err in not sufficiently pruning the coarse roots than in the opposite direction, whilst gardeners who are only such in name, but do not love their work, will be more likely to cut away remorselessly at fibre as well as at coarse roots. Pears (and Apples if any are so grown) especially require no mercy shown to the long fibreless roots, else they would soon outgrow the possibility of pot culture.

When the trees are first received from the nursery they will probably be found to vary much in size, and therefore at first starting pots of various sizes will be used, but the smaller the pots, in reason, the better. I say, in reason, because I have seen pots used far too small, the short fibrous roots being obliged to be pushed straight down the sides instead of being laid out horizontally. There is no space in the house saved by stinting the pot room, as a tree's head will always occupy more space than its pot, however reasonably large.

However the pots may vary at first, all fruiting trees will in a year or two work into three sizes, viz. eights, or 12-inch pots; sixes, or 14-inch pots; fours, or 16-inch pots, and of these sizes we use by far the greater number of sixes. Pots should, of course, be scrupulously clean and dry, and so should the "crops" be likewise. In repotting year by year, it will at first be necessary to advance the trees one size of pot; but as they increase in age we almost always repot in the same sized pot as before, only very occasionally giving an advance shift, and never going beyond a "four," or 16-inch diameter pot.

The pot well crocked, and a little soil placed over, the ball of the tree is set firmly in the centre, and the upper two-thirds of the fibrous roots are held upwards with the left hand and compost rammed very firmly and evenly down in the lower part of the pot. For this purpose a wooden rammer that reaches easily to the bottom of the largest pot is used. A few more roots are then laid out, more compost rammed upon them, and so on till the pot is almost full, an inch and a half or two inches being left at the top for future dressing.

When the trees are all finished, which should be not later than the first week in November, preferably a fortnight earlier

they are all plunged in the open on some waste plot of ground for the winter, and no protection whatsoever is needed, save to prevent the taller ones from being blown over by the wind. No watering will be required until they are moved into the house in February.

In January we look over the Pears and Plums and finish up their pruning. They should, however, require comparatively little done to them at this time of year if they have been properly pruned in summer and early autumn. The leading shoots on all the branches will, however, need looking to and shortening.

The last week in January the house, which all this time has been full to overflowing with Chrysanthemums, is thoroughly cleaned out, the woodwork brushed over, the glass (if necessary) cleaned, the side walls lime-washed, and the floor raked and rolled. A day's thorough cleaning up now may save weeks of combating greenfly, &c., in the spring.

The date of bringing the Peaches and Nectarines into the house is more or less governed by the weather, and varies between February 1st and March 1st. They should not be brought in when severe frost is prevalent, or when the ground is sodden with wet. The first spell of bright, fairly dry, open weather should be seized upon to bring them in. The outside of the pots may be washed if necessary; but this should be done out-doors, unless sharp frost prevails.

After the trees are settled in the house no heat whatever is required until they come to bloom, but plenty of free ventilation should be given, and they will need watering occasionally with clean water. We always use spring-water for watering, as it contains, in our district, a good deal of lime, which we consider useful to all fruit, stone fruit especially.

From the day the trees are first brought in, even before they have any leaves, and on until the fruit is colouring with ripeness (except only when they are in bloom), the trees are syringed—once a day when the weather is damp and gloomy, otherwise night and morning. For syringing rain-water is always used, occasionally with a little soot stirred in it and allowed to settle.

In about a month, *i.e.* about the middle of March, the bloom-buds will be showing pink, and two days before we judge the flowers will open we move in the Pears and Plums, and give the house a thoroughly good strong smoking to destroy any infant

greenfly there [may be upon the buds or stems, for greenfly in the Peach-bloom is ruination. So important is this point that we generally smoke two nights in succession.

At this time also we turn on a little heat at night, enough—but, if possible, only just enough—to keep the frost out, and this we continue until the fruit is set, and even longer if sharp frost prevails. In the daytime during blooming time, if the weather is very damp and the air surcharged with moisture, we keep a little—very little—warmth in the pipes to dry the air and assist the general diffusion of the pollen.

As a rule the trees are covered with blossom, our trouble being too much rather than too little, and no doubt it would be a great advantage to thin the blossoms before they begin to expand; but, unfortunately, I have not enough, or sufficiently skilled, hands to venture as yet upon this operation. If, however, any particular tree, such as Alexandra Noblesse sometimes, for instance, or Lord Napier, has not more bloom than it can carry fruit, we set each blossom carefully with a camel's-hair brush, using the pollen from one of the small-petalled varieties. It may be only fancy, but I always think the pollen of the small-petalled varieties is more potent than that of the more beautiful large-petalled flowers. The great majority of trees which have an abundance of blossom we go round morning and afternoon, and give the stem of each a sharp, firm hit with the side of the hand, and this we find sets the pollen flying all over the house and secures an abundant set of fruit. The Plums as they come to bloom we find equally easy to set, but not so the Pears, whose pollen seems heavier and stickier. These we go over diligently with the camel's-hair brush, and by placing a plant or two of *Cytisus* among the trees endeavour to attract every passing bee to visit them. Notwithstanding this we always regard Pears as an uncertain crop, whereas with Peaches, Nectarines, and Plums we never waste a moment's anxiety upon them; we know that in due season we shall reap.

All this time (and always) ventilation has been given—very freely when the outside air is even moderately dry, rather more sparingly when it is surcharged with moisture.

After the Peaches and Nectarines are well set we always manage to get another night's smoking before the Plums and Pears (brought in a month later) are in bloom, and if one or two

of them are already in flower we transfer them to a shed for the one night whilst the house is in smoking, for we regard it as a thing imperative to have a good smoke as soon as the Peaches are set, in order to keep the greenfly out of the young growth coming.

The thinning of the fruit is rather an anxious matter, for at this time by far the greater number of the trees will be found to have set five or six times as much fruit as they can carry. We go over the trees roughly as soon as ever the blossom drops and take out about two-thirds, and leave the final thinning until "stoning" is well over. Then it is that one wants one's enemy to come for a day's work, so heartrending is it to cut out such a number of nice fruits; and though we resolve every year to be less lenient than the last, yet somehow we always find we leave too many on the trees. Probably the better plan would be to resolve beforehand how many each tree should be allowed, and stick to the resolve if possible. The Plums are almost as difficult to thin as are the Peaches. The Pears are much easier; for one thing they set less freely, and hanging, as they generally do, in clusters, it is simple rule of thumb to cut out all but one fruit in each if the clusters are thick upon the tree, or to leave two each if the clusters are few and far between. I prefer to leave the fruit at the base of the bloom-cluster rather than at the apex. Pears should not be rough-thinned at all, but done once only after they have "pipped."

We now begin to prune the Peaches and Nectarines, cutting out all unfruitful wood not wanted for the extension of the tree, painting each cut as we go with plain shellac dissolved in spirit of wine; and though April may seem a strange time to prune, yet it is in many ways convenient, and we have never observed any bleeding or other ill effects to follow. This is the pruning of last year's wood. Later, as the young shoots grow, as soon as they have developed eight good leaves we pinch them back to five, and it is important that this be done whilst the part pinched off is quite soft and immature, as then it only checks the shoot enough to throw all the buds into bloom-buds except the last one, which soon again takes up the growing, and will need in its turn to be similarly pinched back later on. If by any oversight the pinching back of a shoot is not done till the wood is fairly developed and hard, we almost invariably find that

its end bud will be a bloom-bud as well as those lower down, and then the whole shoot is comparatively worthless, being without a terminal growth-bud.

We prune the Plums in much the same way as regards the summer pinching, only leaving the leading shoots rather longer and pinching the side shoots, if they develop, rather shorter.

Pears in pots are more difficult to summer prune, and I am far from sure of having arrived at the best method. Our plan, roughly stated, is as follows: Pinch in all side shoots to three or two leaves, unless, of course, a side shoot be now and again left for the extension of the tree; but beware of getting your tree too crowded with branches—better by far have too few than too many. The leader of each branch we allow to run till about the end of June, when we “crack it over” at the sixth to the tenth leaf, according as the variety is one that breaks into growth easily from the base of the shoot or not. Josephine de Malines is an example of a Pear which has the greatest possible objection to break from the buds towards the base of the shoot; she is therefore “cracked over” at the sixth, or even fifth, leaf to compel the lower buds to swell. Experience can alone decide which varieties need stern treatment and which may be allowed more license. When a Pear-tree has grown as tall as the height of your house or other circumstances will admit of, do not crack its leader over, but let it grow away at will, and then in the January pruning cut it right out from the base. This you may continue doing for several years, thus keeping your tree at full size but without any expansion.

By “cracking over” we understand not cutting the shoot off or breaking it off, but with finger and thumb cracking the inner wood of the shoot, breaking the bark only on one side, so that the shoot hangs down from the crack, but still draws sap through the uninjured side of the bark. The merit of the plan, if it has any, is that the check to the shoot is not nearly so severe or sudden as if it were cut right off, and the buds below are far less likely to start into wood-growth.

As soon as the young fruit on the Peaches and Nectarines (and later on on the Pears and Plums) is growing well away, you will want to help it in stoning. All this time we have been watering the trees with clear spring-water. We now begin the process of feeding the trees. We prepare a very rich compost, with which we

bank up the trees to as much as 3 inches above the rim of the pot. The compost is moulded and pressed and kneaded with the fingers into the form of a dyke, with a very steep side outwards and sloping more gradually inwards, so as to form a shallow basin round the stem for watering. The compost is prepared as follows:—

2½ barrow-loads of turfy loam.

1 „ „ well-rotted (rather sticky) dung.

1 „ „ mortar rubbish, pounded fine.

2 gallons of bone meal.

1½ „ Clay's Fertiliser.

1½ „ Thomson's Vine Manure.

Every fruiting tree is banked with this compost between setting and stoning, and as soon as stoning is over we begin to use weak liquid manure for watering instead of the clean spring-water. The syringing is, of course, continued daily or twice a day, except during blossoming time, and free ventilation is continued. I had almost said in season and out of season; but, of course, a little judgment is required even in this—but very little.

In this way we obtain (for a small household) an abundance of Peaches and Nectarines from the middle or end of June to the middle or end of September, varying according to the date of bringing the trees in and the amount of sunlight in April and May. We get also a small but select quantity of the best late Pears, and Gage Plums galore.

The house I have described holds 28 Peaches and Nectarines, 21 Pears, and about a dozen Plums; but these last we sometimes shift out-doors when the growth of the other trees becomes at all crowded. The trees average from 5 to 9 feet in height. The Peaches and Nectarines we regard as an always safe crop, averaging about three dozen a tree, that is to say ninety dozen of fruit every year; or, in other words, a dozen Peaches and Nectarines a day for three months from this one orchard-house. The house has been built now for six years, and we have every year had an abundant (or even superabundant) crop. The Plums are as sure as the Peaches, but the Pears are more fickle; still, by having duplicate trees, and crowding them a little at blooming time before the foliage is grown, and then turning out-doors those that fail to set a good crop, we manage to keep a small but constant supply.

In the middle of September all the trees are moved out on to a spare plot of ground, where they stand until potting, and thus the year's cycle is finished.

We keep three times as many Plums in pots as we can accommodate in the house. One-third we take into the house for blooming; the others are plunged in a spot sheltered from the east wind and from the morning sun, and when their fruit is three-fourths grown that of the first third in the house is ripe, and the one set of trees come out and their places are occupied by half of the others, and in this way three gatherings of Plums are obtained. But there are very few Plums to my mind worth this trouble, excepting the various Gages.

I am often asked by people who see the trees laden with fruit, "Can they go on bearing like this year after year?" Well, mine have done so for six years, and look as if they were good for four years more at least, and no one need grudge renewing them every eight or ten years. The one difficulty is to prevent them getting "leggy"—a difficulty I confess I have not yet entirely mastered.

Another thing often asked is, "Is the flavour as good as that of open-air fruit?" And here I find it so difficult to make people understand that whether in-doors or out different varieties possess different degrees of flavour, and that we grow different varieties for the different excellences each one possesses. Alexander and Waterloo we grow for their earliness, for without them we should not have, as we had this very year, Peaches ripe on the 12th day of June, and their flavour is good; but we do not expect it to be as super-excellent as Alexandra Noblesse, which under similar treatment ripens only in August. There is no denying, again, that some of the latest Peaches, which under similar treatment ripen in September, are somewhat coarse-grained, and had I my choice I would rather have Barrington, Crimson Galande, or Royal George from a wall than Sea Eagle or Princess of Wales, or even the Nectarine Peach, from the house; but having no wall there is no choice. But bearing these things in mind, and comparing the same varieties only, I should say the house-grown fruit is at least equal in flavour and superior in meltingness to that grown in the open.

I subjoin a list of the varieties I have grown.

PEACHES :—

1. Alexander.

2. Waterloo.

These are our two earliest Peaches. One ripened on the 12th, the other on the 14th of June. They are very similar, and it is difficult to say which is the better of the two. Waterloo the larger, but we fancied Alexander slightly the better flavoured.

3. Early Beatrice.

4. Early Louise.

Of these we prefer Louise, but Beatrice is a few days earlier, and both are useful to carry on the succession.

5. Hale's Early.

6. Early York.

7. Abec.

These succeed one another admirably, and carry us to the end of July.

8. Dr. Hogg.

9. Crimson Galande.

10. Royal George.

11. Magdala.

12. Alexandra Noblesse.

13. Barrington.

These spread over August, and contain amongst them the (to my mind) Peach of Peaches, Alexandra Noblesse. It is a large white Peach, not commending itself by its colour, but its flavour and juiciness are unequalled. It is not such a profuse bloomer as the others, but we have never yet failed in a sufficient crop.

14. The Nectarine Peach.

15. Princess of Wales.

16. Sea Eagle.

Our latest Peaches carry us to the middle of September. The flesh of the latest Peaches is, I think, always coarse-grained, but the flavour of the Nectarine Peach is altogether beyond reproach.

Note.—Most Peaches are better flavoured and more melting if gathered a day or two before they are quite ripe and kept in a cool place. If left to hang too long they become first mealy and then pasty.

NECTARINES :—

1. Lord Napier.

The earliest and perhaps the best. We have three trees of it, and by placing them in different positions in the house we can have Lord Napiers from the middle of July to the middle of August.

2. Stanwick Elruge.

3. Rivers' Orange.

4. Old White.

5. Goldoni.

This is the order in which they have ripened with us, but they are very near together, and all excellent, a well-ripened Goldoni being a magnificent fruit.

6. Elruge.

Hardly worth growing when those before and after are so superior.

7. Pine-apple.

8. Spenser.

9. Dryden.

Pine-apple is a great favourite, being very juicy and sweet as honey. Spenser and Dryden are magnificent additions, carrying on the Lord Napier type without interruption to the first week in September.

10. Victoria.

The skin is always tough, and sometimes a little bitter, but it is a thoroughly good fruit, and most valuable for its lateness.

PLUMS :—

1. Oullins' Golden.

Worth growing for its earliness, ripening in the house very early in July. It is of handsome appearance, but the flavour hardly corresponds thereto.

2. Old Green Gage.

3. Early Transparent.

4. Transparent.

5. Late Transparent.

6. Reine Claude de Bavay.

7. Coe's Golden Drop.

These are all magnificent for flavour. In speaking of

fruit that is to be eaten uncooked, I seldom refer to beauty of appearance, never to size. Indeed excessive size is often a real detriment to fruit you wish your friends to eat; they are actually afraid to help themselves to a monster specimen, and ashamed to have it seen upon their plate.

I have mentioned none but the very best Dessert Plums, though I have grown most others, but they are hardly worthy of house treatment.

PEARS :—

1. Superfin.
2. Pitmaston.
3. Emile d'Heyst.
4. Durondeau.
5. Comice.

Few, if any, of the early or half-early Pears are in my opinion worth the trouble of house culture; but the above, from their superior excellence, should never be omitted. Nos. 1, 4, and 5 are three of the finest Pears for flavour in existence.

6. Knight's Monarch.
7. President Osmonville.
8. Beurré d'Anjou.
9. Conseilleur de la Cour.
10. Winter Nelis.
11. Nouvelle Fulvie.
12. Easter Beurré.
13. Olivier de Serres.
14. Beurré d'Aremberg.

With a dozen and a half or so of fruits, of each of these, a little household like my own need never be without good Pears till after Christmas is well over. A supply of really good English-grown Pears after the 1st of January is a thing to be hoped for rather than expected.

Note.—Late Pears from an orchard-house are generally much more melting, and of richer flavour, than from the open air.

ZONAL PELARGONIUMS FOR WINTER.

By Mr. CHARLES PEARSON, F.R.H.S.

[Read November 15, 1892.]

I HAVE great pleasure in responding to our Secretary's request to give a few details as to the treatment of Zonal Pelargoniums (popularly mis-called Geraniums) for winter flowering, as there is no more useful plant grown for this season when its requirements are thoroughly understood; and I quite hope that its general adoption for this purpose will still keep our old favourite in the front rank of popular plants, a position it was at one time in danger of losing owing to the decline of the bedding-out fever.

The great charm of the Zonal Pelargonium for winter work lies in the wonderful range of colour which it possesses, from the darkest crimson, through scarlet, salmon, and pink to purest white, in which respect it is without a rival during the duller and colder months of the year; and I have frequently noticed that people who object to its vivid tints in summer, disparaging a well-bloomed batch of plants as "gaudy," will in December and January revel in the feast of colour they afford, and declare that it has the effect of a tonic on them.

It is often objected that the flowers are too fragile to bear cutting and travelling, but this defect (which in itself is less marked in winter than in summer) may easily be overcome by careful packing and gumming, the latter operation consisting of placing a drop of florist's gum in the eye of each flower, after which they may be sent long distances with safety. It should, however, be remarked that the durability of the flowers is sometimes lessened by the inferior quality of the gum employed. This, I believe, is owing to the use of impure methylated spirit for dissolving the gum, in order to cheapen production. This may be avoided by making one's own gum, which is easily done by dissolving a little white gum-lac in spirit of wine, adding gum until it is thick enough to drop freely from a pointed stick. Spirit of wine is, of course, dearer than the methylated spirit, but it is safe, and also free from the objectionable smell of the latter.

The first point in arranging for a future display of winter-flowering Zonals is the choice of suitable varieties, some being much better suited for the purpose than others; but this I have left to the last, and propose to refer you to our *Journal* for my selection, as the reading of a long list of names is unprofitable and very wearying to the audience. I may, however, say here that it is not advisable to include too many of the very dark crimsons, such as Henry Jacoby, as in sunless weather they often lose their characteristic shade and turn to a dull magenta. Chas. Smith is the best of this class for keeping its colour under disadvantageous circumstances. I would advise the introduction of a very limited number of doubles, as the singles generally flower much more freely, and are, to my taste at least, decidedly more beautiful. I would also recommend a far greater variety of colour than is generally seen. We have now such a wealth of lovely tints among the winter-flowering Zonals that it is deplorable to see a house full of nothing but the old scarlet Vesuvius. Even when required principally for cutting, for table and other decorations, there is no necessity to confine oneself to one or two varieties, as, though the range of colour is so wide, there is a certain tone running through all the Zonals which makes them harmonise, and I have rarely seen the colour tints of any two plants disagree even when a hundred sorts were mixed indiscriminately on one bench.

Having settled what kinds to grow, the next question is, When should the cuttings be struck? The answer depends somewhat upon the kind of plants wanted. If good-sized specimens for decoration, the cuttings may be inserted in August the previous year; but if only smaller plants or cut flowers alone are the object, spring-struck cuttings are preferable. In the first case the cuttings should be potted, as soon as struck, into "large thumbs," giving a move when ready into about 4-inch pots, and finally repotting early in June into 6-inch or 7-inch pots, according to the size of the plants. After this they should be plunged outside in a sunny spot, taking care that there is a sufficient thickness of ashes under the pots to keep worms from ascending into them. Summer treatment consists of watering, pinching the stronger shoots, and removing all flower-buds as soon as they appear. No stimulants should be given, as the object is to produce a firm, well-ripened, short-jointed growth.

The treatment of spring-struck plants will be pretty much the same, excepting that the flowering pot should be smaller, say about 5 inches in diameter. If flowers are the sole object in view, then it is possible to get a good crop from cuttings struck as late as June, but these must be grown straight on under glass without a check, and bloomed in very small pots; little plants of *Vesuvius* grown in this way in small thumb-pots, and carrying one or two good trusses of flower, are sometimes used for table decoration, and are very effective.

One of the most important points to be noted in both cases is that the plants must be placed under cover before being saturated by heavy autumn rains, otherwise the fibrous feeding roots will decay, and much of the lower foliage turn yellow and fall, after which a full measure of success is impossible. If house-room is scarce in autumn, a temporary erection of frame-lights may be put up just to protect the plants from excessive wet, until cold weather makes housing imperative. When safely under cover the plants should have air pretty freely until they are well accustomed to their new quarters. They must be watered carefully, and the buds removed as before until within six weeks of the time when the first flowers are required.

A few words as to the best form of house may be useful, though the nature of the plant under discussion will itself indicate to the observant the style of structure required. This should be arranged so that the plants may catch every ray of our too rarely visible winter sun. A low span-roofed house, with the benches not too far from the glass, is the best. As regards aspect, I prefer that the house should run from N.E. to S.W., as in this position the morning sun shines straight through the house with as little obstruction from the rafters as possible, whereas the afternoon sun in November and December is scarcely worth consideration. While on the subject of light a hint may be given to thoroughly wash all glass inside and out, if it be at all dirty, before the plants are introduced. This is, of course, a necessity in smoky, foggy districts, but there are few places where it will not increase the chances of success. The question of "*bed versus bench*" has been discussed, but I have myself very little preference, having seen equally good results from plants on lattice benches or on solid beds surfaced with ashes, though in the latter case a small hot-water pipe carried close

over the heads of the plants was, I am assured, an important factor of success by keeping a warm, dry atmosphere round the blooms, and thus preventing damping in wet, dull weather.

With respect to temperature, the house should not be allowed to fall below 50° at night, and would be better 5° higher, excepting in very severe weather ; in the daytime it may average 60° , with 5° to 10° rise when the sun shines brightly. This item of temperature I look upon as the most important of all, as if neglected even for a short time the plants receive a check from which it is impossible to recover them, not, at least, until spring, when the special object of their cultivation has, of course, been missed.

Watering must, it almost goes without saying, be carefully done, each plant being watered only when necessary, and care taken during the operation not to spill it about on the foliage and benches. This work is best performed in the early morning, so that the house may become dry again before night.

If large trusses of flowers are required for exhibition purposes, pinch out the point of the shoot just beyond the bloom-bud as soon as it appears, which will have the effect of very much increasing the size of the bloom. I may say that this is particularly necessary in the case of some of the strong-growing semi-doubles of Continental origin, such as *Le Bruant*, which would otherwise run too much to leaf.

I find I have omitted all mention of potting soil ; and as this is the first difficulty likely to occur to a beginner, I will add a word or two on this point, though it will probably be superfluous to many. My own soil consists of turf taken from a rather light loam (alluvial drift). This is stacked some months before it is required, with a little cow manure sprinkled between each layer. It is chopped down at potting-time, and a little sand or grit added, nothing more. Leaf soil, of which many gardeners are so fond, is, I believe, distinctly detrimental to the Zonal Pelargonium.

I am convinced that there is a great future before Zonals treated on the lines I have indicated for winter flowering, and that no good garden will in years to come be considered complete without them. At the same time, I cannot conscientiously recommend their adoption by anyone who has not sufficient glass accommodation, either to give them a small house to themselves

or to manage the one in which they are placed in accordance with their requirements. To buy a few prepared plants in autumn and stick them amongst a miscellaneous collection of greenhouse plants, or perhaps even in that slaughter-house for plants, an architect's conservatory, where they are ten or twelve feet from the glass, is only to court failure and bring undeserved blame upon a grand race of plants.

SELECTION OF ZONAL PELARGONIUMS FOR WINTER FLOWERING, ARRANGED ROUGHLY UNDER COLOURS.

SINGLES.

<p><i>Scarlet.</i> C. Mason. Corsair. J. L. Baldwin. John Gibbons. Rev. Dr. Morris. Vesuvius.</p> <p><i>Scarlet suffused Plum colour.</i> Eric. Falstaff. Mrs. Gordon. Phœna. Shirley Hibberd.</p> <p><i>Orange.</i> Golden Vesuvius.</p> <p><i>Crimson.</i> Chas. Smith. H. Jacoby. Nelly Thomas. T. Hayes.</p> <p><i>Rose.</i> Mlle. Trine.</p>	<p>Mrs. H. T. Barker. Radha. Rev. R. D. Harries. Rosy Morn. William Bealby.</p> <p><i>Rosy Pink.</i> Constance. Mrs. Leavers. Ethel Lewis.</p> <p><i>Salmon.</i> Ayesha Ellen Clarke. Juliet. Katherine Moreton. Lady Chesterfield. Mrs. Norman.</p>
	<p><i>White.</i> Queen of Whites Improved. Sir Percivale.</p> <p><i>Blush White.</i> Stella Massey.</p>

DOUBLES.

<p>F. V. Raspail (<i>scarlet</i>). Guillon Mangilli (<i>cerise</i>). Le Bruant (<i>rosy red</i>).</p>	<p>Lord Mayor (<i>pink</i>). Turtle's Surprise (<i>scarlet</i>). Wonderful (<i>scarlet</i>).</p>
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EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETING.

JANUARY 12, 1892.

G. PAUL, Esq., in the Chair.

Fellows elected (29).—W. M. Appleton, W. Bell, W. W. Bull, L. de Bunsen, N. L. Cohen, H. Fish, J. H. Fitt, Colonel P. Fitzroy, J. Gibson, T. Godfrey, H. Hicks, Rev. W. P. Holmes, Mrs. Hulme, Mrs. A. James, T. Johnson, C. G. L. Kelso, H. T. Lea, Mrs. Gwyn Lewis, J. Long, P. R. Malleson, B. Matthews, D. H. Mathews, J. W. Page, Rev. E. Palin, Rev. S. E. Perry, J. I. Rogers, C. J. Salter, J. Thompson, John Wood.

Associates (3).—T. Bond, A. Lamb, W. White.

Societies affiliated (2)—Croydon Horticultural Society, Hull and E. Riding Chrysanthemum Society.

A paper on "Winter Vegetables," by Mr. W. Iggulden, was read by the Secretary.

ANNUAL GENERAL MEETING.

FEBRUARY 9, 1892.

Sir TREVOR LAWRENCE, Bart. (President of the Society), in the Chair.

The Minutes of the last Annual General Meeting of February 10, 1891, were read and signed.

The following elections took place :—

Fellows (64).—A. J. Baker, W. Bain, A. E. Beach, T. J. Berridge, T. W. Binyon, T. W. Bolam, E. L. Brown, F. Cartwright, J. Chapple, Kally C. Chatterjee, S. Chubb, W. C. Clark, J. Colbourne, J. Collier, P. Collings, J. Davis, C. J. Davis, J. B. Denton, G. A. Dickson, F. G. Fellowes, G. V. Fiddes, A. D. Fraser, A. E. Furness, A. Gilbertson, T. E. Gray, R. W. Green, C. T. Green, Mrs. W. Grimston, J. Guscotte, A. C. Hammersley,

E. Handley, Mrs. E. Harvey, E. L. Hill, E. Hinton, Mrs. Hodgkinson, H. Hallis, J. R. Hollond, T. Horsman, G. Humphries, Miss E. Hunter, Rev. J. Jacob, C. Whitfield King, W. R. Lee, H. S. Leon, W. Lestocq, Sir Herbert Maxwell, Bart., M.P., Rev. H. H. Mogg, W. H. Morton, E. M. Palmer, E. S. Phillips, Pantia Ralli, H. D. Rawlings, W. Salmon, J. Sanderson, S. M. Seger, J. Seth, Rev. W. Shirley, A. J. Sich, F. Sich, T. Smithson, Mrs. Thursby, Miss Tillard, W. Wells, Miss F. C. Wright.

Societies affiliated (2).—Hessle and Howdenshire Horticultural Society, Woodford Horticultural Society.

Messrs. H. J. Veitch and W. Marshall were appointed Scrutineers of the ballot.

A hearty vote of thanks was proposed by Professor Michael Foster, F.R.S., and accorded unanimously, to the retiring members of Council, viz.: Sir John T. D. Llewelyn, Bart., Everard A. Hambro, Esq., and Martin R. Smith, Esq.

To fill the vacancies thus caused on the Council the following gentlemen were proposed for election, viz.: Sir Herbert Maxwell, Bart., M.P., C. J. Lucas, Esq., and Mr. Owen Thomas.

The following gentlemen were proposed for re-election as officers, viz.: *President*—Sir Trevor Lawrence, Bart.; *Treasurer*—Philip Crowley, Esq., F.L.S.; *Secretary*—The Rev. W. Wilks, M.A.; *Auditors*—Messrs. Harry Turner, Henry Williams, and A. H. Pearson.

After a careful examination of the ballot papers, the Scrutineers reported the above-named gentlemen to be all duly elected.

The following resolution, previously adopted at a meeting of the Council, was then put to the meeting and unanimously carried, viz.: "That the form F in the Appendix to the Bye-laws be altered in regard to the 'Note,' which shall in future read as follows:—'R means that the member against whose name that letter appears retires under the operation of Bye-laws 65 and 84.'"

The Chairman, in moving the adoption of the Report of the Council, reviewed with satisfaction the progress made by the Society during the year 1891. He called particular attention to the Fruit and Floral Meetings which had been held regularly every fortnight in the Drill Hall; to the Great Flower Show in the Temple Gardens, and to the Conferences on Hardy Perennials, Small Fruits, Michaelmas Daisies, Sunflowers, and Conifers, which had been held at Chiswick.

Baron Schröder briefly seconded the adoption of the Report.

Professor Foster, in moving a vote of thanks to the Chairman, congratulated the Council upon the good work that had been done. He could not speak too highly of the Society's *Journal*, which he felt sure was looked forward to and appreciated by Fellows of the Society who lived far away in the country, and were not always able to be present to hear what was said at the meetings.

The Report for the year 1891, as printed below, was then unanimously adopted.

REPORT OF THE COUNCIL FOR THE YEAR 1891-92.

The year 1891 has again been one of steady work and progress for our Society.

Four Conferences have been held at Chiswick, viz.: on Hardy Summer Perennials; on Strawberries, Raspberries, Currants, and other small Fruits; on Perennial Sunflowers and Michaelmas Daisies; and on Conifers. The attendance of Fellows and others at these Conferences, as also at the Fortnightly Lectures in the Drill Hall, has been decidedly more encouraging than in previous years. Fellows would greatly assist the Council by making these Meetings and Lectures better known among the general public.

Seventeen Fruit and Floral Meetings have been held in the Drill Hall, besides those held at Chiswick, and Lectures have been delivered at fifteen of them. The number of awards has been as follows: On the recommendation of the Floral Committee, 33 First Class Certificates against 40 in 1890, 183 Awards of Merit against 117, 4 Commendations against 2 last year, and 8 Botanical Certificates. On the recommendation of the Orchid Committee, 34 First Class Certificates against 56 last year, 38 Awards of Merit against 47, 10 Botanical Certificates against 9. On the recommendation of the Fruit and Vegetable Committee, 6 First Class Certificates against 6, and 7 Awards of Merit against 7 last year; Commendations 1.

The Society's great Show, held (by the renewed kindness of the Treasurer and Benchers) in the Inner Temple Gardens, and opened by Her Royal Highness the Princess Christian, was as great a success as ever, alike in the number of visitors, the quantity and quality of the exhibits, the propitiousness of the

elements, and the consequent pecuniary result. The best thanks of the Society are due to all who so kindly brought their plants for exhibition or otherwise contributed to the success of this Show.

The Conference on Conifers, held at Chiswick on the 7th and 8th October, was most unfortunate in the weather experienced, and in the consequent smallness of the attendance of Fellows. In all other respects it was most successful, the papers read being most valuable, and the exhibition of specimens such as has certainly never been gathered together in one place before. The Report on the Conference is being kept back in order that the list of Conifers may be made quite complete, with their synonyms and short descriptive notes, a work which entails an enormous amount of labour and reference. It is hoped that the volume may be ready in March.

The Society's general work of Scientific experiment and investigation, and of the practical trial of various plants, has been going on steadily at Chiswick, under the superintendence of Mr. Barron. Trial has been made of 117 varieties of Tomatos, 48 of Turnips, 31 of Celery, 33 of Leeks, 43 of Runner Beans, and 49 of Dwarf French Beans. Ninety-seven new varieties of Potatos and 72 new Peas have been tested. In the Floral Department 225 varieties of Carnations, 50 of Picotees and 50 of Pinks, 300 Dahlias, 60 Ivy-leaved Pelargoniums, 59 Violas and 74 Pansies, 15 different strains of China Asters, 116 Fuchsias, and 32 of Sweet Peas have been tried. A very large collection of Perennial Asters (Michaelmas Daisies) and Sun-flowers have been grown, and very carefully examined by a Committee of experts, both in regard to their proper nomenclature and also their value as hardy border flowers. The confusion found amongst them was so great and so widespread that it has been decided to withhold the Committee's Report until the plants shall have flowered again, and the Committee's decisions verified and confirmed. Experiments have also been made with a Fruit Evaporator, kindly presented to the Gardens by Messrs. Mayfarth, and most satisfactory and encouraging results have been obtained in the drying of both Apples and Plums.

The Society's *Journal* has been continued so as to enable Fellows at a distance to enter more fully into and reap the benefits of the study and work of those more actively engaged at headquarters. Three parts, forming vol. xiii., 646 pages, with 69 plates of new plants, &c., have been published during the

The most noticeable features in last year's work, besides the Conifer Conference, were the issue of a pamphlet on "Fruit-trees recommended for Cottagers and small Farmers," and the improvement of the condition of the Gardens at Chiswick. The Fruit pamphlet* was purposely issued at a price below the actual cost, in order to promote as wide a circulation as possible. Two editions have been prepared, one for England and another for Scotland. Of these, 52,000 copies have been put into circulation, 13,000 being issued at the expense of the Society.

In round numbers about £1,728 has been expended at Chiswick this year on the general work, and repairs and keeping up of the Gardens. A further sum of about £200 has been laid out in special repairs, viz. in the rebuilding of House No. 6, and in furnishing a new boiler, &c., to the Great Vinery. The receipts from the Gardens by sale of surplus produce amount to about £630, making the net cost of the Gardens about £1,300.

The Council of the Society has been in communication with several County Councils with respect to the Lectures on gardening which are now being given in many parts of the country, and have undertaken to conduct examinations on behalf of any County Council so wishing it, at the conclusion of these courses of Lectures, and to award suitable certificates, &c., to proficient students.

The Council regret that the scheme for the erection of a Horticultural Hall has for various reasons been for the present abandoned, and the guarantors released from their promises of support. It is hoped, however, that at some future time, when circumstances are more favourable, these promises may be voluntarily renewed.

In conjunction with the Lindley Library Trustees, the Society's Library has received considerable attention. All serial publications have been kept up to date, a large number of valuable volumes have been bound, and the following new books amongst others added to the Library, viz.: "Art and Practice of Landscape Gardening," "Manipulations de Botanique Médicale," "Census of the Grasses of New South Wales," "Die Veredelungen und ihre Anwendung für die verschiedenen Bäume und Sträucher," "Flora Bulgarica," "Laubholzkunde," "Nadelholzkunde," "Orchids, Culture and Management," "Pflanzen-

* See *Journal*, vol. xiii. pt. 3, p. 411.

leben," vol. ii. ; "Revisio Generum Plantarum," "Orchid Album," &c., &c.

The best thanks of the Society are due to all those who, either at home or abroad, have so kindly and liberally presented books to the Library or plants or seeds to the Gardens. A list of the donors has been prepared, and will appear in the next number of the *Journal*. The Council also wish to express, in their own name and in that of all Fellows of the Society, their great indebtedness to all who have so kindly contributed, either by the exhibition of plants, fruits, flowers, or vegetables, or by the reading of papers, to the success of the Conferences and fortnightly Meetings. Special thanks are due to those who so kindly contributed Conifer specimens for the Conference in October.

The papers read at these meetings, most of which have been already published in the *Journal*,* are as follows :—

January 13. "Persian Cyclamen," by Mr. W. Warren ; "Hardy Cyclamen," by Rev. W. Wilks, M.A. ; "Germination of Cyclamen," by Dr. Maxwell T. Masters, F.R.S.

March 10. "Snowdrops," by Mr. James Allen, Mr. F. W. Burbidge, F.L.S., and Mr. Melville.

March 24. "The Cultivation of Hardy Bulbs and Plants," by Herr Max Leichtlin.

April 14. "Lachenalias," by Mr. F. W. Moore.

April 21. "Cape Bulbs," by Mr. James O'Brien.

May 12. "Hybrid Rhododendrons," by Rev. Prof. Henslow, M.A., F.L.S.

June 9. "Alpine Plants," by Rev. C. Wolley Dod, M.A.

June 23. "Tea Roses," by Mr. T. W. Girdlestone.

July 7. "Hardy Perennials," by Mr. W. Marshall ; "Wild Gardening in Meadow Grass," by Mr. W. Robinson.

July 7. "On some of the Summer Flowers of my Garden," by Rev. H. Ewbank, M.A. ; "The Picturesque Use of Hardy Summer Perennial Plants," by Miss Jekyll.

July 8. "Hardy Fruits," by Mr. George Bunyard ; "Strawberries for Private Gardens," by Mr. W. Allan ; "Strawberries for Forcing," by Mr. G. Norman ; "Gooseberries for Private Gardens," by Mr. D. Thomson ; "Raspberries," by Mr. G. Wythes.

July 21. "Early Peaches," by Mr. T. Francis Rivers.

August 11. "Ornamental Stove and Greenhouse Plants," by Mr. J. Hudson.

August 25. "The Gladiolus," by Rev. H. H. D'ombrain, M.A.

* Several back numbers of the *Journal* can still be purchased at reduced prices. For List, see "Arrangements, 1893," p. 16.

September 8. "Hardy Water and Bog Plants," by Mr. Geo. Paul.

September 22. "Insect-eating Plants — *Nepenthes*, *Dionæas*, *Sarracénias*, &c.," by Mr. R. Lindsay and Mr. Lewis Castle.

October 6. "Sunflowers," by Mr. J. G. Baker, F.R.S.; "The Genus *Aster*," by Professor G. L. Goodale; "Michaelmas Daisies," by Rev. C. Wolley Dod, M.A.; "Perennial Sunflowers," by Mr. D. Dewar; "Culture of Sunflowers," by Mr. E. H. Jenkins.

October 7. "Conifers," by Dr. Maxwell T. Masters, F.R.S.; "The Coniferæ of Japan," by Mr. H. J. Veitch, F.L.S.; "Conifers as Specimen Trees and for Landscape Gardening," by Mr. George Nicholson, A.L.S.; "Conifers for Timber and in Plantations," by Mr. A. D. Webster; "The Decorative Character of Conifers," by Mr. Edmund J. Baillie, F.L.S.; "Conifers at Bickton, Devon," by the Hon. Mark Rolle; "Conifers at Dropmore," by Mr. Charles Herrin; "Conifers in Denmark," by Professor Carl Hansen.

October 8. "Conifers," by Mr. W. T. Thiselton-Dyer, C.M.G., F.R.S.; "The Value in the British Islands of Introduced Conifers," by Mr. Malcolm Dunn; "The Quality of Coniferous Timber as affected by Sylvicultural Treatment," by Dr. Wm. Somerville, D.Sc., B.Sc., F.L.S.; "The Timber of Exotic Conifers grown in Scotland: its Uses and Comparative Value," by Mr. D. F. Mackenzie; "Fungoid and other Diseases of Conifers," by Professor Marshall Ward, M.A., F.L.S.; "Insects Injurious to Conifers," by Mr. W. F. H. Blandford, M.A.

October 27. "Autumn Tints," by Mr. Harry J. Veitch, F.L.S.

November 10. "Varieties of Soils," by Mr. W. Ingram.

The hearty thanks of the Society are due to the Chiswick Board and to all the Members of the Standing Committees—viz. the Scientific, the Fruit and Vegetable, the Floral, the Orchid, and the Narcissus Committees—for the kind and patient attention which they have severally given to their departments; also to the exhibitors who have contributed to so great an extent to produce the valuable results of the various Conferences held.

The Council have the sad duty of recording the death of forty-four Fellows during the year, and amongst them they regret to find the names of the Duke of Devonshire, Earl Granville, Earl of Dartmouth, Sir R. Wallace, the Right Hon. W. H. Smith, J. van Volxem, W. A. Dickson, J. Dominy, C. Haycock, W. Richards, and W. Barron.

During the last few years the Council have, amongst other matters, been considering methods of interesting amateurs more in the Society and its work, and of rendering to them a greater

personal return for their subscriptions. To this end they have already established the fortnightly Lectures, and the great Temple Show; have promoted various Conferences on interesting Horticultural subjects, and have revived the publication of the *Journal*. In 1890 they further decided to re-establish the Society's ancient custom of offering prizes to amateurs, and a Schedule was circulated in the "Arrangements for 1891." The Council regret that these prizes attracted so little competition; but they have decided to continue them again in the year now commencing, and a total sum of £515 will be found offered, as it is possible that the Schedule last year was hardly sufficiently known.

A scheme for the affiliation of Local Societies was put forward last year, and about forty Local Societies have availed themselves of it. The Council express the hope that Fellows will promote the affiliation of societies in their own immediate neighbourhood.

Attention having lately been directed to the desirability of establishing a National School for Technical Educational in Gardening and Spade Industry, the Council have consented to co-operate with the Worshipful Company of Gardeners in the matter. The Council have not thought it right, without a special mandate from the Fellows, to devote any portion of the Society's income to this purpose; but they think it highly desirable to afford the undertaking the use of all the existing facilities at Chiswick. An arrangement is therefore in course of preparation whereby a Home will be opened at Chiswick, in the joint name of the Society and the Company, for students of the age of 15 to 18, and a three years' course of practical lessons will be given in the Gardens, accompanied by elementary lectures on Plant-life and Chemistry, and other branches of study helpful to Gardening, the whole of the expense being borne by the Company, the Gardens supplied by the Society, and the management placed in the hands of a joint committee. The Superintendent is of opinion that the work of the Students can be so arranged as in no way to interfere with the present use of the Gardens.

A proposal has been made to hold an International Fruit Show in London this autumn, and the Society has been invited to join in carrying it out. The Council have appointed the Chairman of the Fruit Committee as a delegate to the Provisional Committee, and they hope to be able to give cordial support to the proposed Show.

Dr. ANNUAL REVENUE AND EXPENDITURE ACCOUNT

To ESTABLISHMENT EXPENSES—

	£	s.	d.	£	s.	d.
Salaries and Wages	300	18	8			
Rent of Office	123	3	0			
Printing and Stationery	144	16	2			
Publications—Journal, &c.	536	9	0			
Postage	72	2	8			
Coal, Gas, and Water	3	6	2			
Miscellaneous	43	14	10			
				1,224	10	6

„ SHOWS, MEETINGS, and CONFERENCES—

Rent of Drill Hall and Cleaning	92	16	0			
Special Shows—Temple	534	10	11			
„ Others	39	3	2			
Advertising	18	0	0			
Prizes and Medals	164	18	0			
Printing, &c.	57	8	4			
Labour	87	8	11			
Superintendent of Flower Shows	50	0	0			
				1,044	5	4

„ CHISWICK GARDENS—

Rent, Rates, Taxes, and Insurance	298	6	3			
Superintendent's Salary... ..	225	0	0			
Labour	669	5	1			
Manure, Implements, &c.	92	10	1			
Coal and Coke	184	19	11			
Repairs	148	4	7			
Special Repairs	196	10	0			
Water and Gas... ..	17	11	5			
Miscellaneous	82	0	11			
				1,914	8	3

„ HORTICULTURAL HALL 37 1 1

„ BALANCE TO GENERAL REVENUE ACCOUNT 218 16 8

£4,439 1 10

Cr.

January 22, 1892.

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BALANCE SHEET, 31st DECEMBER, 1891.

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GENERAL MEETING.

MARCH 8, 1892.

G. BUNYARD, Esq., in the Chair.

Fellows elected (46).—F. Bacon, G. Batten, J. Broome, W. F. R. Buck, W. P. Burkinshaw, W. N. Carne, T. Child, F. F. Coleman, Rev. W. A. Duckworth, W. Dunn, H. W. Gilbeart, G. M. Gilbert, W. Goaring, A. H. Godfree, W. J. Godfrey, J. G. Godwin, F. Hill, H. Himus, F. W. Horn, Col. T. Hussey, Professor Huxley, Mrs. Joad, Miss Johnston, Mrs. T. Keogh, J. King, R. Lyell, J. W. Martin, S. C. Phillips, Mrs. Pollock, Mrs. Sanderson, B. Scott, Rev. S. M. Scroggs, T. P. Sheldon, R. Smith, P. H. Stevenson, J. G. Symonds, W. R. Thompson, W. D. Tucker, F. Ullmer, Col. Walcott, J. Walls, W. Wells, W. Whiteley, W. Woodstock, E. Wormald, F. C. Young.

Society affiliated.—Gravesend Horticultural Society.

A paper on "Plants for House Decorations," by Mr. J. Wills, was read by the Secretary.

GENERAL MEETING.

MARCH 22, 1892.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair.

Fellows elected (13).—H. P. Barrand, A. Bubb, W. Chambers, T. Dobell, Hon. Mrs. P. Glyn, E. O. Greening, H. Lowenfeld, Miss E. Mill, S. T. Mott, J. R. Richardson, T. A. Todd, Miss Trollope, E. Wood.

Associate.—P. Davidson.

A paper on "Melons" was read by Mr. C. Ross.

GENERAL MEETING.

APRIL 12, 1892.

D. MORRIS, Esq., M.A., in the Chair.

Fellows elected (24).—W. Bardney, J. Botting, Lady Brooke, J. Burchett, E. Burrell, Miss Dickinson, W. Fraser, C. Godfrey, W. C. Hackett, A. E. Halse, W. S. Harris, Mrs. B.

Harvey, K. R. Hedges, A. Higgott, J. Hooker, Mrs. Horner, W. Laxton, W. Moss, W. R. Newport, M. H. Quayle, Jas. Read, W. Smythe, P. W. Taylor, C. A. Young.

Societies affiliated (3).—Beddington, Carshalton, &c., Horticultural Society; Hound St. Mary, &c., Horticultural Society; and Winchmore Hill Horticultural Society.

A paper on "Daffodils" was read by the Rev. G. P. Haydon.

GENERAL MEETING.

APRIL 19, 1892.

The Rev. H. H. D'OMBRAIN in the Chair.

Fellows elected (7).—H. H. B. Bradley, J. Butler, H. F. Cox, F. Crook, C. Reid, R. H. Wallace, W. Wells.

A paper on "The English Florist's Tulip," by the Rev. F. D. Horner, was read by Mr. J. Douglas.

GENERAL MEETING.

MAY 3, 1892.

Dr. HOGG, F.L.S., in the Chair.

Fellows elected (20).—H. S. Aldersey, W. Allitt, J. G. Ashmore, Alf. Barker, W. Bennison, C. Cole, P. Clarke, Mrs. F. J. Cullingford, Countess De La Warr, G. H. Dowsett, J. P. Eckert, H. English, C. W. Fincken, R. B. Lindsay, J. Lyon, H. Payn, J. M. Peart, T. R. Sim, I. F. Thoday, Gen. O. Williams.

Society affiliated.—St. Albans and District Horticultural Society.

A lecture on "Bulbous Irises" was given by Professor Michael Foster, F.R.S., and will be published in 1893.

GENERAL MEETING.

MAY 17, 1892.

J. DOUGLAS, Esq., in the Chair.

Fellows elected (20).—A. A. Bennett, F. Black, E. G. Braund, T. Cooper, J. Cranston, R. Fox, J. L. Godlee, C. E.

Heinke, F. G. Lemon, E. V. Low, J. O. McQuone, W. Nelson, H. W. Pearson, S. Phillips, Col. L. de T. Prevost, Dr. G. Walker, W. Webber, B. Wells, H. Wigley, T. F. Wodehouse.

Societies affiliated (2).—Chudleigh Chrysanthemum Society, Highbury Vale Horticultural Society.

A paper on "Hardy Climbers and Creepers," by Mr. W. C. Leach, was read by the Secretary.

GENERAL MEETING.

JUNE 7, 1892.

G. BUNYARD, Esq., in the Chair.

Fellows elected (40).—A. F. Byvoet, W. J. Cross, R. Crossling, J. H. Dalton, Baroness H. de Worms, P. W. S. Ell, J. F. Ford, Marchioness of Granby, S. W. Grant, W. B. Greenfield, J. Groves, Mrs. V. Harcourt, R. Henderson, J. H. Kitson, Mrs. A. Lloyd, C. T. Lucas, E. Macrory, Sir James Maitland, Bart., J. W. Melles, G. W. Miler, P. A. Moltens, S. Morse, R. Neal, C. C. Nichols, B. Nicholls, J. C. Pare, W. Pasley, E. M. Pollock, Countess of Radnor, C. W. Smith, J. W. Stubbs, J. C. Tasker, Mrs. Tasker, H. Thorne, Dr. Wallis, H. R. Williams, Mrs. J. S. Wing, Hon. Miss Winn, Mrs. F. R. V. Witts, G. Yeld.

Associate.—J. E. Littlewood.

Societies affiliated (2).—Beckenham Horticultural Society, Constantine Horticultural Society.

A paper on "Summer Pruning and Training of Fruit Trees," by Mr. A. Young, was read by the Secretary.

GENERAL MEETING.

JUNE 21, 1892.

Sir TREVOR LAWRENCE, Bart. (President), in the Chair.

Fellows elected (13).—J. H. Arkwright, M.A., J. E. Backhouse, F. Bostock, W. K. Bruce, Mrs. A. Ellis, J. Grant, G. Harris, Leonard Hart, T. Huxley, L. W. Lamotte, J. H. Morgan, M.A., Miss H. E. Pipe, F. West.

A lecture on "The Management of Trees in Parks and Gardens" was given by Mr. W. T. Thiselton-Dyer, C.M.G., &c., and will be published in 1893.

GENERAL MEETING.

JULY 12, 1892.

J. DOUGLAS, Esq., in the Chair.

Fellows elected (12).—Miss Eddy, W. Hall, W. G. Hawson, H. Huntley, Maj.-Gen. A. H. Hutchinson, T. Jannoch, J. B. Marsden-Smedley, C. L. V. Newman, G. F. Norman, J. N. Shanks, P. Warnford-Davis, W. P. Wright.

A lecture on "Orchids for a Cool House" was given by the Rev. E. Handley.

GENERAL MEETING.

JULY 26, 1892.

D. MORRIS, Esq., M.A., in the Chair.

Fellows elected (9).—Sir Charles Barrington, Bart., H. Becker, Mrs. R. C. Christie, F. Curtis, J. Denny, A. W. Lockhart, W. J. Myatt, Hon. Walter Rothschild, W. A. South.

Society affiliated.—New South Wales Horticultural Society.

A paper on "Insect-eating Plants," by Mr. A. J. Manda, was read by the Secretary. Numerous specimens to illustrate the lecture were sent by Messrs. Pitcher & Manda, J. Veitch & Sons, and B. S. Williams & Son.

GENERAL MEETING.

AUGUST 9, 1892.

G. BUNYARD, Esq., in the Chair.

Fellows elected (7).—A. Collinge, J. Box Deane, S. G. Lutwyche, G. P. Miln, W. L. Milne, Sir J. E. Moss, W. Rolfe.

A paper on "Fuchsias," by Mr. G. Fry, was read by the Secretary.

GENERAL MEETING.

SEPTEMBER 6, 1892.

GEORGE GORDON, Esq., in the Chair.

Fellows elected (14).—J. Bester, F. J. Ferguson, J. Ferguson, J. Horne, F. Jenkins, H. King, Mrs. Lindsay, F. E. Myatt,

G. G. Myatt, Mrs. Peart, Miss H. Richardson, F. J. Tarr, Mrs. Whitbourn, G. S. Walker.

A paper on "Root Pruning" was read by Mr. G. Bunyard.

GENERAL MEETING.

SEPTEMBER 20, 1892.

G. PAUL, Esq., in the Chair.

Fellows elected (7).—W. S. Campbell, F.L.S., L. Dunbar, G. Ferguson, Mrs. Hollins, H. M. Mackusick, G. J. Poston, Mrs. G. Wedgwood.

A paper on "Variation of some Hardy Plants under Cultivation," by the Rev. C. Wolley Dod, was read by the Secretary.

GENERAL MEETING.

OCTOBER 4, 1892.

Dr. M. T. MASTERS, F.R.S., in the Chair.

Fellows elected (8).—J. C. Cox, A. Dunning, R. Erbe, C. Holden, E. Scaplehorn, J. B. Wilkin, A. G. Wombwell, H. J. Wood.

A paper on "Michaelmas Daisies" was read by Mr. D. Dewar.

GENERAL MEETING.

OCTOBER 18, 1892.

Dr. M. T. MASTERS, F.R.S., in the Chair.

Fellows elected (8).—Rev. J. Bufton, W. F. Craies, G. G. Gray, LL.D., T. A. Jeffcoat, Sir Hugh Low, Lieut.-Gen. A. P. Rivers, W. Hart Sitwell, J.P., D. C. Stewart.

A lecture on "Cycads" was delivered by Mr. W. Carruthers, F.R.S., and illustrated by numerous specimens of cones and fronds from the Royal Gardens, Kew, and a group of well-grown plants—chiefly *Cycas revoluta*—from Messrs. E. D. Shuttleworth & Co., Fleet, Hants.

GENERAL MEETING.

NOVEMBER 1, 1892.

Dr. HOGG in the Chair.

Fellows elected (13).—Oscar Berry, F. Bouney, Lieut.-Colonel C. S. Close, Mrs. H. S. Cowdell, A. Crooke, A. E. Darby, E. Dodds, W. Farrance, R. Milner, John Piper, Robert Smith, Frank R. Spelman, Rev. F. H. Woods.

The Secretary (Rev. W. Wilks, M.A.) read a paper on "Fruit Trees in Pots."

GENERAL MEETING.

NOVEMBER 15, 1892.

G. BUNYARD, Esq., in the Chair.

Fellows elected (13).—William Crump, R. Greenfield, F. A. Gwilliam, Gilbert W. Harwood, C. G. Harwood, Joseph Lucas, Richard Parker, G. Perrin, F.L.S., Mrs. Pullman, C. E. Shea, W. H. Thomas, Charles Whitehead, Rev. Clement C. Woodland.

C. Pearson, Esq., read a paper on "Zonal Pelargoniums for Autumn Flowering."

GENERAL MEETING.

DECEMBER 13, 1892.

JOHN T. BENNETT POË, Esq., in the Chair.

Fellows elected (26).—Sir James Bain, Bart., H. J. Bell, V. Benoist, James W. Bentley, Edward H. Brown, H. A. Burberry, E. Burrell, Allan Edward, John B. Farmer, M.A., W. Fitzgerald, George Goldsmith, J. Jaques, junr., Frank Kingsford, Dr. F. Kranzlin, Rivers H. Langton, W. Berkeley Monck, G. D. Owen H. C. Prinsep, Thomas Statter, S. Howard Stott, Alfred Stott, W. Wade Wartnaby, Mrs. W. H. Williams, A. G. Williams, S. T. Wright, Arthur Young.

SCIENTIFIC COMMITTEE.

JANUARY 12, 1892.

D. MORRIS, Esq., in the Chair, and eight members present.

Thelephora laciniata.—In reference to this fungus, specimens of which attacking Rhododendrons were sent to a previous meeting by Dr. Hugo Müller, the following note was submitted by Mr. Massee: "*Thelephora laciniata*, Pers., is a very common species, as a saprophyte overrunning twigs and heaps of leaves lying on the ground; at the same time it readily passes on to living branches and superficial roots, especially if the surface has been abraded, and then becomes parasitic in its nature. As a parasite, it has been noted on the living roots and prostrate branches of ericaceous plants—*Vaccinium*, *Erica*, *Calluna*—in Hungary by Kalchbrenner, also in England. It has also been observed as a parasite on living Conifers in Germany by Klotzsch."

Beetle in Dendrobium.—Mr. Blandford reported that the beetle referred to at a previous meeting was a Scolytid beetle probably undescribed.

Diseased Gooseberry.—Mr. Burbidge sent specimens of Gooseberry branches showing globular spongy outgrowths from the bark, of the size of large Cherries, and cracked on the surface. Mr. Burbidge stated that the swellings produce roots with great freedom if treated as ordinary cuttings. Dr. Masters called attention to the similarity in appearance to the growth frequently seen on Maréchal Niel Roses, and also on Vines and Passion Flowers; but in the case of the Gooseberry there were often numerous buds visible. In some of these cases the presence of a slime fungus (*Myxomycete*) had been detected. Gooseberry growers attributed the formation to water accumulating on the branches, and promoting the formation of roots. The specimens were referred to Mr. Arthur Lister.

Black Knot.—Dr. Masters showed specimens of this disease received from the United States. The disease occurs in Plum trees, and is due to a fungus (*Plowrightia morbosa*) which produces a black nodulated outgrowth, spongy within, on the surface of the branch. The tissues affected seem to be the inner

layers of the bark and the cambium layer, the cells of which are disintegrated and broken up into a spongy mass. The disease has been described by Professor Farlow, and is very common in America, but, happily, it is scarcely, if at all, known here. Destruction by fire of the affected branches is the only remedy that can be suggested, though probably spraying with sulphate of copper in an early stage would be effective.

Eucalyptus.—Dr. Masters exhibited a branch of *Eucalyptus globulus*, in which the usually smooth surface of the bark was broken up into an irregularly lobed, corky mass. The branch had been received from Professor McOwan, of Cape Town, and it was considered by him that the disease might be due to the presence of bacteria. A specimen had been previously sent to Professor Marshall Ward, who has promised to report upon it.

SCIENTIFIC COMMITTEE, FEBRUARY 9, 1892.

D. MORRIS, Esq., in the Chair, and seven members present.

Excrescence from Stems of Gooseberries.—Mr. Lister reported that there was no slime fungus on the specimens sent; and Mr. Massee, who also examined the specimens, failed to find traces of fungoid growth. From the presence of one or more maggots in the tumour, Mr. Massee suggested that the outgrowths were attributable to insect agency, but on a review of all the circumstances it seemed as if the restriction caused by a shred, and the accumulation of moisture, were the predisposing causes of the growth.

Hellebores.—Mr. Burbidge, in a letter, commented on the circumstance that cut flowers of *Helleborus niger* remain unwithered much longer than those of *H. orientalis*, a circumstance probably due to a difference in internal structure. Dr. Scott undertook to examine and report. Mention was also made by Mr. Burbidge of the circumstance that flowers of *H. niger* gently forced last in good condition in water much longer than do flowers of the same variety in the open air. The flowers of *H. niger* last longer in water if the stalks be slit lengthwise from below upwards. The result is that, the tension being removed, the cut segments of the stem curl outwards away from the centre, and that a larger absorbent surface is exposed.

Snowdrops.—Flowers of *G. Alleni*, *G. Elwesi*, and *G. nivalis* var. *Imperati* were shown from Mr. Burbidge.

Monstrous Flowers.—A parti-coloured Tulip from Mr. Marshall and a curious *Cypripedium Dayanum* from Mr. O'Brien were shown, and will be reported on by Dr. Masters at the next meeting.

Disa grandiflora.—Messrs. Veitch showed a plant with a thick fleshy creeping rootstock, bearing leaf-shoots, by means of which the plant could be propagated.

SCIENTIFIC COMMITTEE, MARCH 8, 1892.

D. MORRIS, Esq., in the Chair, and seven members present.

Adventitious Buds on Ribes.—Mr. Burbidge sent specimens of these productions on *Ribes aureum*, to show that the conjecture advanced on a former occasion, to the effect that the swellings in question were due to constriction and to the accumulation of moisture by a ligature, such as a shred, was not tenable, as in the case now sent the plant grew as a shrub without any such ligatures, and yet these swellings were produced as in a burrknot Apple.

Hellebores.—Dr. Müller stated that he had performed experiments similar to those detailed at a previous meeting by Mr. Burbidge, and, owing to the diversity of the results obtained, concluded that the slitting of the flower-stem longitudinally had no definite relation to the length of time that the flowers remained unwithered. Dr. Scott stated that he had examined the anatomical construction of *H. niger* and *H. orientalis*, and found that the conducting system is much more completely developed in the quickly withering *H. orientalis* than in the long-lived *H. niger*. Possibly the greater amount of transpiration due to the presence of leafy bracts below the flowers of *H. orientalis* might have something to do with the more rapid withering of the flowers.

Two-coloured Tulip.—Dr. Masters reported that he had examined the Tulip exhibited at the last meeting, and found that the distribution of the colour was as follows: One of the outer segments, that nearest the axis, or the posterior part of the flower,

was red, the other two yellow. Two of the inner segments were half yellow, half red, the red portions being in juxtaposition with the red outer segment. Of the stamens, the three in the posterior part of the flower—that is to say, one of the outer (opposite the red sepal), and two of the inner series—were completely red instead of being, as might have been expected, half red and half yellow.

Cypripedium Dayanum.—Dr. Masters reported on the specimen submitted to him at a former meeting. In this, the true lip was absent, but each of the two lateral petals was partially developed in the form of a lip. The posterior stamen (A, 1), which is usually not developed in *Cypripedium* (though it is the only one present in other Orchids), was also present in a lip-like condition. The two stamens (a 1, a 2), were present in their ordinary condition. The flower in question was, therefore, partly double, and added another illustration of the probable development in the future of “races” of double Orchids.

Larvæ destructive to Grass in Hong-Kong.—From Mr. Ford came, through the Director of the Royal Gardens, Kew, specimens of the larvæ and of the perfect insect of a species of Tinea, reported to be very mischievous in Hong-Kong. The specimens were referred to Captain Elwes for examination and report.

Hybrid Narcissi.—Rev. G. H. Engleheart sent flowers of a hybrid produced by the inter-fertilisation of *N. triandrus* and *N. monophyllus* var. *alba*, to show the similarity of the result obtained by the inverted crossing of the two species.

The Dyeing of Flowers.—From Mr. W. Brockbank came a large series of dried flowers, the venation of which had been rendered apparent by the action of aniline dyes. The cut ends of the flowers-stalks were immersed in the fluids, so that the colouring matter was absorbed by the vascular tissue of the flowers. The results were very striking, and likely to be of use to botanists.

Plants exhibited.—From Mr. Burbidge came *Helleborus torquatus*, from the College Botanic Garden, Dublin; *Mistletoe* from *Pyrus Malus* var. *præcox*, on which it is found that the berries are produced more freely than on other trees—the foliage, on the other hand, being less well developed. These effects are analogous to those produced by grafting on a dwarfing stock. *Tellima grandiflora rubra*, remarkable for the rich red colour of

the foliage, the colour being especially noticeable in winter time, so that the plant makes a good setting for bulbs. The winter coloration of the leaves of this species is analogous to that observed in some of the Ivies, notably the variety *atro-purpurea*, which turns nearly black in winter. A flower of the rarely seen *Dissochroma viridiflora* from the same garden was shown. It is remarkable for its green colour and the peculiar shape of its large corolla—between funnel-shaped and bell-shaped.

Disease of Mountain Ash.—The Rev. W. Wilks sent a specimen, accompanied by the following letter: "I noticed a Mountain Ash tree with a very stout large trunk fit to carry a tree of large dimensions, but the actual tree was comparatively very small and stunted, and every twig of every branch was ended in this way, the diseased part being always downwards underneath the line of the stem bearing it. The tree at a distance looked almost like some evergreen, so densely was it crowded with these diseased parts." In the specimen the ends of the branches presented oblong or club-shaped swellings irregularly cracked on the surface, as well as deeply fissured in places. Internally it consisted of woody tissue of harder consistence than usual, the deep fissures being lined with dead wood, around which the new and harder wood was deposited. A similar condition is not very uncommon in the Hawthorn, but the determining cause is unknown, and can probably only be ascertained in the young state, which, unfortunately, rarely comes under observation. The deep tunnel-like cracks are suggestive of insect injury, and of subsequent efforts to repair the damage.

SCIENTIFIC COMMITTEE, MARCH 22, 1892.

W. BLANDFORD, Esq., in the Chair, and six members present.

Hybrid Narcissi.—Rev. G. Engleheart exhibited further specimens of his reciprocal crosses between *N. Corbularia monophylla* and *N. triandrus*, which showed that the same results accrued in whichever direction the cross was effected. A Botanical Certificate was recommended to Mr. Engleheart in recognition of the interest and success of his experiments.

Swellings on Ribes.—Mr. Michael reported that he had discovered no *Phytoptus* on the specimens submitted to him.

Basal Disease of Daffodils.—Rev. W. Wilks exhibited specimens of this disease, which Mr. Michael considered as very likely to be the result of the attacks of a mite, *Rhizoglyphus Rolini*. Mixtures of sulphur and soft-soap, or of carbolic acid, were recommended as likely to be beneficial.

Sugar-cane attacked by Boring Insect.—Mr. Blandford showed specimens of cane attacked by a boring beetle at the nodes. The direction of the perforation was from within outwards.

Birch Bark.—Mr. Burbidge sent specimens with the following letter:—

“I beg to send for the inspection and consideration of your Committee some fragments just taken fresh from the trunks of *Betula papyracea*, reared here from seeds kindly sent from the Royal Gardens, Kew, some ten or twelve years ago. It can be written upon with ease with an ordinary pen and ink, as these examples will show. Its texture is very soft and fine, except here and there, where transverse corky lenticels occur. It would be interesting to know the part this exquisitely finely textured bark plays in the economy of the tree, as contrasted with other barks of a more rough and corky nature, such as say *Quercus Suber* or ‘Cork Oak.’ Both are, no doubt, identical in their being practically impervious to water, either from within outwards or *vice versâ*. As a contrast I send a small piece of stem of *Arauja* (*Schubertia*), or *Physianthus grandiflorus*, with netted, rugose, corky bark, arranged around a stem quite green, and doubtless rich in chlorophyll.

“*Ginkgo Seeds*.—I also enclose seedlings of the ‘Maidenhair’ or ‘Ginkgo Tree’ of China and Japan (*Ginkgo biloba*). Dr. E. P. Wright, M.D., F.L.S., Professor of Botany in the University of Dublin, saw the ripe fruits in one of the public gardens at Rome last autumn, a crop of golden Plum-like fruits amongst the Maidenhair-like leaves, and succeeded in obtaining a supply of the seeds through H.M. Ambassador, the Marquess of Dufferin and Ava.

“I am enabled by the courtesy of Dr. Wright to send a few of these fresh seeds for the inspection of the Committee, as well as seedlings raised from the same, sown on December 8, 1891,

in a mean temperature of 60° Fahr. The fleshy covering of these seeds, analogous to that of our native Yew berry, is edible, and is used as dessert in China and Japan according to Siebold and other authors. It is well known that this tree rarely if ever fruits in Britain, a fact perhaps due to its dioecious character.

"These seeds also illustrate a very interesting physiological fact mentioned by Sachs ('Text Book,' p. 665). 'If the temperature is sufficiently high, the green colouring substance (chlorophyll) is found in the cotyledons of Conifers, and in the leaves of Ferns in complete darkness, as well as under the influence of light.'

"I am by no means certain that Ferns and Conifer seeds alone possess this peculiarity; it is known to occur in other seeds, notably in those of *Acer pseudo-platanus*, the common Sycamore, the Seakale, *Crambe maritima*, and possibly others which I have not examined.

"*Doryanthes excelsa*.—It may be of interest to state that this plant, known as the Spear Lily of New South Wales, is just now opening its flowers in this garden, the crimson Lily-like flowers being congested on a scape 10 feet high and 2 inches in diameter."

Other specimens sent by Mr. Burbidge comprised *Candollea cuneiformis*, *Erythronium Hartwegi*, *Asparagus plumosus* in flower, *Masdevallia Chimæra* var. *Roezli*, *Arisæma ringens*, *Stapelia deflexa* in fruit, *Coccoloba platycladon*, *Acer macrophyllum* (buds), and *Begonia corallina*.

SCIENTIFIC COMMITTEE, APRIL 12, 1892.

Dr. M. T. MASTERS in the Chair, and seven members present.

Galls on Ribes.—A report was received from Mr. E. A. Fitch upon the galls on *Ribes aureum*, in which he observed that "the only sure thing to be said is that the galls are made by an unknown species of *Phytoptus*, allied to that making the well-known witch-knots on Birches." (See *Entomologist*, vol. x., pp. 83-86, April 1877). He remarks that the species of *Phytoptus* are but little known in this country.

Narcissus Bulbocodium, fasciated.—Mr. Morris exhibited a specimen with five flowers united, and remarked that of twelve pots

at Kew every plant bore fasciated stems. Mr. Wilks observed that in this species fasciation is constantly occurring.

The Branching of Endogens.—Mr. Morris exhibited specimens illustrative of the apparent dichotomy in certain plants. In Pandanus, Agave, Yucca, and many other plants, the dichotomous arrangement of the branches is due, not to a bifurcation of the bud, as is usually supposed, but to the occasional development of a single axillary bud. The growth of this bud soon equals that of the parent axis, and causes the deflection of the latter, so as to give a forked appearance. This was shown to be the case in a specimen of Pandanus pygmæus. In a specimen of Aloe socotrana, on the other hand, the pseudo-terminal position of the inflorescence terminating the axis had led to the growth of the axillary buds, which were lengthening out into branches of a dichotomous character. A good example of the forked appearance caused by the destruction of the terminal bud was shown in a drawing of a Coccoanut Palm; while a similar result in an exogen, due to an abortive terminal bud, was illustrated by the common Lilac.

Scale Insects on Palms in West Indies.—A communication was read from Mr. Cockerell, of Jamaica, explaining difficulties in the way of carrying out experiments for their destruction, as the people there can only test the value of a statement by results, and if these failed, prejudices against future suggestions would arise. Again, since Cocoa-nuts are attacked by many enemies, even if a remedy proposed should answer for the scales, the trees might perish from other causes. He doubted whether scale insects ever killed them, though, having weakened the trees, they might then fall a prey to other parasites. Moreover, different scale insects have different habits; some, as *Aspidiotus palmæ*, appears to live only on the Cocoa-nut, while *A. articulatus* infests many other plants, so that if the latter were destroyed on Palms, it would soon re-infest them from other sources. He thinks that all the injurious coccids have reached Jamaica in comparatively recent times; and the fact that their parasites have not been imported as well may account for their increase.

Raspberries attacked by Dothidea.—Some canes were forwarded from Mr. J. Willard, Holly Lodge, Highgate, covered with black spots, which have appeared during the winter months for the last five or six years. Transplanting and manuring, and

the introduction of new sorts, have failed as remedies. The fungus causing the mischief has been recognised by Mr. Massee as a *Dothidea* (? *D. rosæ*).

Narcissus Bulbs attacked by Acari.—Mr. Michael reported upon the bulbs received from Rev. W. Wilks as follows : “ I find two species of *Acarus* in large numbers, either of which is sufficient to account for the damage. Both are most injurious creatures, and commence destruction upon healthy plants. One is the large and conspicuous *Rhizoglyphus* (species probably *Echinopus*, but there was no adult male specimen, without which the species cannot be determined for certain). This is a well-known destroyer of bulbs. The other, which occurs in great numbers, is extremely minute, and not to be detected without a microscope. It is a *Tarsonymus*; the species is most like *T. oryzæ* (of Targioni-Tozzetti). All species of this genus are most destructive. It is only of late years that their existence has been detected, on account of their small size, the transparent and colourless nature of their bodies, and their habit of burrowing into leaves, stalks, &c. I should say that in this case they were doing even more damage than the *Rhizoglyphus*. This is, I believe, the first instance of *Tarsonymus* being found in subterranean structures. A species of this genus, *T. Buxi*, destroyed every Box-tree in Turin. *Tarsonymus* is well known to be very destructive to Sugar-canes in Barbadoes and Queensland.” A discussion followed as to the best remedies to be applied. Mr. Michael suggested a treatment of soap and sulphur before planting, but added that it is almost impossible to destroy the eggs by chemical agencies. Mr. Wilks observed that, since it is not till springtime when the eggs are hatched, the application would be difficult, seeing that the bulbs are planted in the autumn; moreover, Mr. Dod has shown that one effect of sulphur upon bulbs is to arrest their growth by the formation of sulphurous acid gas. The Rev. Mr. Haydon had suggested, in his lecture on Daffodils, the use of powdered quicklime, and although this might destroy the outer scales as well as the eggs which lie among them, experiments with bulbs of comparatively little value would show whether the interior portions remained uninjured. Mr. McLachlan suggested paraffin. Mr. Wilks remarked, however, that this remedy, though excellent for aerial organs, was fatal to roots, but whether it would be equally injurious to bulbs could

only be proved by experiment. It was thought that if the bulbs were subjected to vaporised creosote it might prove effective. Dr. Müller mentioned that oil of cloves and oil of cassia used as a watery solution would probably prove capable of destroying the acari, as they are powerful antiseptics.

Carnations attacked by Anthomyiidae.—Specimens were received from Mr. Perry, of Tottenham, of the well-known parasite *Hylemyia nigrescens*, which attacks the crowns, nodes, and basal part of the stem.

Lettuce Mildew.—The Lettuces grown in the market gardens near Ham, Twickenham, &c., are much damaged this year by *Bremia lactuæ*, formerly known as *Peronospora gangliiformis*, Berk., described by Rev. M. J. Berkeley in 1846 as *Botrytis* (*Journ. Hort. Soc.*, i., t. 4). References to the literature are given in Cooke's "Handbook of British Fungi." Mr. W. G. Smith devotes a chapter to this parasite (chap. 34, "Diseases of Field and Garden Crops"), in which he observes that "when frame Lettuces are attacked, a good plan for the destruction of the fungus is to give as much air as practicable, and if possible to leave the frames open for at least a part of one cold night, as a short exposure to cold or slightly frosty air will not materially hurt the young Lettuces. As resting spores are found in old rotting stems, all decayed plants should of course be burnt, especially old stumps, as in them the resting spores of the mildew often exist in myriads."

Primula Forbesi.—A growing and flowering plant was again exhibited. This species was shown by M. Vilmorin on October 6, 1891, when specimens were presented to Kew and Chiswick. At both establishments the plants are in a flourishing condition.

Schizocodon soldanelloides.—A plant was exhibited by Captain Torrens, Poaston Manor, Hayes Common, Kent. It is allied to *Shortia*, both belonging to the order *Diapenseæ*. A vote of thanks was unanimously given to the exhibitor.

Angræcum sesquipedale, Monstrous.—Mr. C. Whitfield King, Ipswich, sent a specimen in which one of the lateral petals was spurred, making a supernumerary labellum.

SCIENTIFIC COMMITTEE, MAY 3, 1892.

Dr. M. T. MASTERS in the Chair, and five members present.

Narcissus Basal Rot.—Specimens of the variety *Troilus* were sent by the Rev. W. Dod, with the following communication: "Of this variety thousands go off every year. With regard to the disease I observe, (1) in places where plants get little or no sun, though they do not flower well, the rot never comes; (2) it attacks particular varieties, *e.g.* *Ard Righ*, *Spurius coronatus*, and *Golden Spur* worse than others; while *Horsefieldi*, *Emperor*, and all of the *muticus* blood are entirely exempt. The *incomparabilis* tribe never show a symptom of it, however delicate their growth may be; nor do any *poeticus* or other delicate *Narcissi*, such as *triandrus*; (3) the best preventive is annual transplanting. *Maximus* used to suffer here, but by this means I now have a large and healthy stock of this form."

Raspberry Canes diseased.—Mr. G. Massee reported on the plants sent to the last meeting from Holly Lodge, Highgate, as follows: "The black patches on the stems are caused by a minute parasitic fungus belonging to the genus *Dothidea*, probably *D. rosæ*, Fr., but as the specimens are immature the species is not certain. *Spiræa* and other rosaceous plants suffer from the attacks of species of *Dothidea*. In all known cases the spores germinate at once when mature, and then infest the younger shoots; hence the entire removal of all diseased portions before the spores are mature is imperative."

Conifers, Growth of.—Photographs were received from Mr. Curtis, of Kensington, showing the comparative growth of a Silver Fir (*Abies pectinata*), and of a Douglas Fir (*A. Douglasi*), which grew side by side for twenty-two years. The former was $10\frac{1}{4}$ inches in diameter, the latter $19\frac{1}{2}$ inches. The trees were taken from a plantation in Ireland, in a soil equally adapted to both. The comparative results showed strongly in favour of the cultivation of the Douglas Fir as a timber tree in Great Britain and Ireland.

Odontoglossum citrosimum, Monstrous.—A blossom was received from Mr. Bull, in which there were three well-developed stamens and three lips, the two extra lips representing two lateral stamens.

Tulip Leaf, Monstrous.—Dr. Masters exhibited a leaf showing a very thick midrib, which was densely clothed with thick and branching cellular processes, which bore stomata and hairs at certain points; a remarkably hypertrophied condition of a not uncommon peculiarity of certain Tulips, which have a row of hairs on the bulb scale, but not, however, on the leaf.

Orchid Leaves attacked by Beetles (?).—Mr. Ingram, of Elstead, forwarded some leaves of imported Orchids attacked apparently by beetles. They were forwarded to Mr. Pascoe for examination.

Azalea Sport.—Mr. G. Paul sent sprays of *Azalea mollis* with yellow flowers, but associated with others which were pure white, the petals being only about three quarters of an inch in length. The stamens, five in number, were almost included, together with the pistil, within the short tube of the corolla. Mr. Paul reports that “It was a chance seedling, and possibly the flowers might have been fertilised with some of the other varieties of *Azalea*, such as *A. pontica alba*; but I think that the reversion to white is through the yellow forms of *A. mollis*, which have smaller flowers as a rule than the orange-coloured kinds, which also open with a whitish shade.”

Pine Apple, Monstrous.—Mr. Morris exhibited a photograph of a tall variety of a Pine Apple from the Straits Settlement, from Sir Hugh Low. It was called the Hen-and-Chickens, as it produced a number of smaller Pines from the base of the stem. They were described as being of a bright red colour, and of excellent quality.

Carnations diseased.—Mr. McLachlan reported that the name of the fly which attacks Carnations, referred to at the last meeting, is *Hylemyia nigrescens*.

SCIENTIFIC COMMITTEE, MAY 17, 1892.

Dr. M. T. MASTERS in the Chair, and four members present.

Orchids attacked by Beetles.—With reference to the case brought before the last meeting, Mr. Pascoe reported that the beetles were *Phytophaga*, belonging, he believed, to the genus *Galeruca*. Although they were on imported Orchids, he considered them like an English species.

Basal Rot.—Mr. Michael reported on this subject as follows: “I have examined the *Narcissus* bulbs sent up by Mr. W. Dod, and affected with ‘basal rot.’ The bulbs looked rather gnawed, and I found one or two *Rhizoglyphus echinopus* on one of them; but, in spite of the destructive character of this mite, it hardly seemed to me that there were enough to have done the damage. The bulbs were decayed just at the base, and nowhere else. There was fungus there, and they looked to me rather as if from some cause water had collected just round the base of the bulb, and had caused a sodden and unhealthy condition. I also examined some ‘rusty’ *Narcissus* bulbs, sent by Mr. Haydon, of Hatfield Vicarage, Doncaster, and received by me from Mr. Morris, of Kew. These bulbs were swarming with the same *Acarus* (*Rhizoglyphus echinopus*), which is quite capable of originating the destruction seen in the bulbs, and of carrying it out, with the assistance of the decay which naturally sets in on the wounded surfaces where the mites have been eating. The bulbs also contained *Anguillulæ*. I believe some species of these are originators, some followers of decay. The *Rhizoglyphus*, however, is quite sufficient to have done the damage, whether the worms assisted or not.” Mr. Morris observed that, in the case of the “rusty” bulbs forwarded to Mr. Michael by him, they were carefully examined by fungologists at Kew, and no fungus was present, as in those sent by Mr. Dod. Mr. Haydon mentions in his letter to Mr. Morris that three were seedlings from *Cambricus*; the others were a variety called *Miriam Barton*. The rusted *cernuus* had been all burnt. Mr. W. Dod had written to observe that there was a mistake in the report of the last meeting, in that *Tröilus* is not a variety which is subject to basal rot. His words were: “I enclose specimens belonging, in this case, to the variety *Tröilus*, which show how thousands go off with me every year.” He now writes: “I meant to say that thousands of Trumpet Daffodils of different varieties die in my garden every year, showing the symptoms, of which I sent bulbs of *Tröilus* as an illustration.”

China Silk.—Mr. Morris exhibited a specimen of this so-called material having the appearance of fine catgut, and read a report from the Foreign Office as follows: “A very strong ‘silk’ is made from the grub called the ‘celestial silkworm’ (t’yn ts’am), or locally ‘paddy insect’ (din t’ang). This grub is found on a

sort of Maple, the Fêng tree, or Liquidambar formosana, Salisb. When the insect is full grown it is thrown into boiling vinegar, on which the 'head' of the gut or 'silk' appears. This is sharply torn out with both hands drawn apart, and is as long as the space between them—say five feet. It is so strong that one single thread of it is sufficient to make a line with which to catch the smaller kinds of fish."

Hellebore with Curled Leaves.—Mr. Dod sent leaves of *H. niger* var. *maximus* with the segments of the leaves inrolled, so as to form closed tubes. He writes as follows: "Can you suggest any reason for the curling up of the leaves? It takes place every year, and in some plants it seems to be spreading. They do not recover from it; the whole growth, including the flowering, is deteriorated. The plants most affected are in a border under glass, but not heated, but it occurs on those out of doors as well. I have tried more water, less water, top-dressing, syringing, insecticides, anti-mildew, smoking, &c., but ineffectually. I can never see any insects on the leaves." The only suggestions the Committee could offer were, either the possible attempt to protect the upper surfaces from the chill due to radiation, as is the prevailing habit with leaves generally when unfolding from the buds; or, since the undeveloped leaves of some other ranunculaceous plants, as *Pæonia Moutan*, have the edges of the segments partially inverted, it may arise from an arrested condition of growth, the margin becoming more and more inrolled as they grow.

Monstrous Fuchsia.—Mr. Morris exhibited a spray from Kew, one flower being hypertrophied, apparently from synanthly or a fusion with another, while the other was somewhat atrophied in having only three sepals, as is often the case with the first flowers that expand in the *Fuchsia*.

Tea Plant diseased.—Mr. McLachlan showed a specimen badly attacked by some mycelium received from Assam. It was forwarded to Kew for examination.

Ficus elastica Fruiting.—Mr. Wythes sent a fine spray of this plant with several fruits upon it. Unlike ordinary Figs, this species bears very diminutive fruit. It is not often known to produce them in this country.

Cephalotaxus.—Dr. M. T. Masters exhibited a bough, showing the leaves partly spreading around the stem in all directions

and partly pseudo-distichous; the first form has been called "Harringtoni," &c., but it is (like the Irish Yew) merely an accidental occurrence.

Tsuga Albertiana.—He also showed a bough of this plant bearing male flowers, which are not often to be seen.

Odontoglossum crispum.—A flowering branch was received from Mr. Bull, all the flowers being apparently abnormal. In one examined by the Secretary the two posterior sepals were coherent, the third was wanting; the three petals were present, but all alike except in size. The two posterior of the three stamens of the outer whorl were present; but the anterior, and all three of the inner whorl, were suppressed. The three carpels were present, but the ovary chamber was greatly distorted, the placenta, usually prominent, not being traceable; the stigmatic depression was nearly obsolete. The above details were traceable by means of the distribution of the vascular cords. There appeared, therefore, to have been a tendency to suppression along the median plane.

Cypripedium caudatum reversed.—Mr. Douglas sent a branch with two blossoms; one was normal, the other completely reversed, showing the *correct* position of the labellum, which is ordinarily upside down.

Tulip fasciata.—Dr. Masters exhibited a specimen of a Tulip, having three smaller-flowered peduncles adherent to it. Not having the bulb, it could not be seen whether the smaller Tulips arose from lateral bulbs, or whether the whole was a multiplication of the main stem.

SCIENTIFIC COMMITTEE, JUNE 7, 1892.

D. MORRIS, Esq., in the Chair, and three members present.

Cattleya Mendeli, Monstrous.—Mr. Wilks exhibited a spray bearing two flowers, both of which were dimerous, in that there were only two lateral sepals, the anterior one being wanting. One of the pair of anterior petals was present and situated nearly normally, but the lip was peculiar in having one half of the form and colour of a labellum, while the other half had that of an ordinary petal. This suggested the idea of a fusion having

taken place between a petal and the lip, only half of each organ, however, being present. Without negating the possibility of this being the case, an examination of the origin, form, and distribution of the fibro-vascular cords entering this complex organ, suggested rather that it was not two, but really only one organ which had developed one half as a lip, the other half as a petal, just as in semi-double flowers a stamen will often develop one anther cell, the other being petaloid. With regard to the position of the parts, while the two sepals were strictly "right to left," the common (transverse) axis of both the petals and of the column was shifted, and so became unsymmetrically situated with regard to the sepals. The ovary cell was replaced by an irregular cavity, with no trace of placentas or ovules.

Iris florentina.—Mr. McLachlan brought a normal flower taken from the same plant from which he exhibited three petals at the meeting held on June 23, 1891. They were half white and half purple. The question was then raised whether it was an indication of reversion to *Iris germanica*, supposing the plant to be a pale variety of that species, or the result of a cross between *I. germanica* and *I. florentina*. A comparison made at Kew with the present flower proved it to be the typical *I. florentina*, which differs particularly in the form of its "falls," these being markedly different from those of *I. germanica*, in that they are more contracted towards the base than is the case with the latter species. The pale variety is known as "albicans," and is quite distinct from *I. florentina*; consequently the appearance of the purple colour on the petals of this species is the more unaccountable.

SCIENTIFIC COMMITTEE, JUNE 21, 1892.

D. MORRIS, Esq., in the Chair, and seven members present.

Tea Plant attacked by Fungus.—The fungus shown by Mr. McLachlan at a previous meeting proves to be *Poria xylostromatoides*, Berk.; an undetermined specimen in the Kew herbarium, evidently the same species, is marked, "The Tea Stems, Cachar, India." The remedies suggested were the rubbing and scraping the stems, with the use of sulphur and lime.

Carnations attacked with Hylemyia Grubs.—Mr. McLachlan

observed that the injury to Carnations was brought to his notice last autumn. The grubs lived beneath the rosette of leaves forming the crown of the plant, and also bored into the stem below the crown. The perfect female insect having now been obtained for the first time, it proves to be *Hylemyia nigrescens* (Rnd.), allied to *H. Cardui*, which feeds in the flower-heads of Thistles. He suggests hand-picking as soon as symptoms of flagging is seen in the Carnations. Mr. McLachlan's note upon this subject will be found in the *Entomologist Monthly Magazine* (2nd ser., vol. iii., p. 135). The Committee will be glad if florists will observe when the Carnations appear to be first attacked, and record any observations they may make, in order to discover the best remedy in future.

Ground Ivy Gall.—Mr. McLachlan exhibited three large green galls on this plant. They are due to *Aulax Glechomæ*, there being one gall-fly in each. He observed that it was an undecided point whether galls are the result of the mechanical puncture, or due to some secretion by the insect, as different kinds of galls are sometimes produced by different broods of the same species—as the root-galls and “Oak-apples” on the Oak. The latter surmise appears to be most probable.

Injury by Fog to Plants.—Professor F. Oliver has prepared and exhibited at the soirée of the Royal Society dried plants, as well as drawings, showing the injuries produced by London fog. Dr. Russell remarked, from some examinations he had made near the end of last year, that the amount of sulphuric acid in the fog was even greater than had been proved to exist in the air at Manchester.

Huskless Barley.—Dr. Bonavia exhibited specimens of three kinds—white, green, and dark purple coloured varieties from India. They were grown in Oude by the Rajah as curious, but were not marketable produce. He also exhibited a small variety of horse-bean called “Bakla,” and specimens of the white “gram,” a variety of *Cicer arietinum*.

Megacarpæa polyandria.—Mr. Burbidge sent a specimen of this remarkable Crucifer. It has twelve stamens instead of six, every one of the usual number being *doubled*. The fruit has two unequally developed carpels, with a narrow dissepiment, somewhat resembling that of Penny Cress, being quite round and flat. It is a native of Western Thibet, W. Himalaya,

Kumaon, at an altitude of 12,000 feet ("Fl. of Br. Ind.,' vol. i. p. 161).

White Ants in France.—Communications were received by Mr. Morris from R. S. Warburton, Esq., of the British Vice-Consulate of Rochelle, respecting the ravages done by *Termes lucifugus*, a native of South Europe and North Africa. It was introduced about the end of the last century, and has now spread almost everywhere at La Rochelle. Many public and private institutions are in a dangerous state, as at the Prefecture, where wooden beams have had to be replaced by iron. They have destroyed part of the archives, and it is found that it is useless to grow certain plants in the gardens (as *Geraniums*), as the ants consume the interior of the stalks. It has been found impossible to destroy or get rid of them. Dr. Müller remarked that they had proved very destructive to Vines in certain parts of France. Mr. McLachlan added that another species (*T. flavipes*), which had appeared and done much damage in Austria, has now been pretty well exterminated. Mr. Morris reminded the Committee that the white ant had once been imported to Kew in a log of the Copal-tree, and that when old slave ships were left at St. Helena, after liberating the slaves, the ants soon spread over that island.

Potato Disease, and the Use of Sulphate of Copper.—Some discussion arose on this subject relative to the statement that on certain occasions, and probably on different soils, it had proved to be less beneficial than expected; and that the question had been raised whether it did not render the soil injurious to plant life. Drs. Müller and Russell pointed out that the results might be very different if there were an excess of the copper salt or of lime, as there might be not enough of lime to precipitate the former, resulting in an excess of copper salt undecomposed in the soil. For example, Dr. Russell stated that he had taken the constituents of the mixture used by Messrs. Sutton, as stated in the *Times*, and found that the lime was *not* sufficient to decompose all the sulphate of copper, so that some of the solution had probably entered the soil. Secondly, the quality of the lime was an important point, as there might be an excess of caustic lime, which would probably be equally injurious. Moreover, the results might vary considerably according as the soil was naturally calcareous or purely siliceous. In the latter case a deficiency of basic materials would very likely bring about an

excess of copper sulphate as a residue. Dr. Russell had noticed that the solution on entering the soil would not at first be decomposed, but if lime or other bases, as magnesia, were present, then it would be completely decomposed, and the copper rendered insoluble. Dr. Müller added the important suggestion that the action of the copper solution might be highly injurious by destroying the nitrifying organisms. The general question, therefore, as to the possible injuriousness of sulphate of copper in the soil, becomes somewhat complicated. It was understood that experiments were about to be undertaken at Chiswick, where the above considerations would be attended to.

SCIENTIFIC COMMITTEE, JULY 12, 1892.

Dr. M. T. MASTERS in the Chair, and four members present.

Termes at La Rochelle.—The Secretary read a letter received from Mr. Warburton, giving further details of the injuries done by *Termes lucifugus* at La Rochelle. He believes it to have been imported from South America. He says: "It cannot now be got rid of, as it has spread too widely—not only at Rochelle, but at Rochefort, up the river Charente, and at Saintes. I am not certain as to what plants it has attacked, but *Pelargoniums* and *Dahlias* are among them. It has destroyed Vines, and any other plants it has come across, such as fruit-trees and most flowers. It lives in wood principally, consequently it does damage to plants only in or near houses. As the ants can only move underground in subterranean galleries, I do not think they could do much harm in open fields, where the galleries would always be destroyed by tillage operations. The *Termes* only spreads in two ways, as far as I can ascertain—namely, by the wood in which it exists being carried to other places, and by eating its way from one house to the next. This last process is a very slow one. I do not think that the *Termes* exists in any other part of France than that part of the Charente Inférieure extending from the entrance of the river Charente to some distance up its course, so far, in fact, as the cargoes of wood from South America used to be carried up in ships in the last century; and at La

Rochelle and Saintes, which were both great places for this import in olden times."

Tomatos and Sulphate of Copper.—As another instance of the possibly injurious effects of this substance, Dr. Masters mentioned that M. Cornu found that its application, though given in the prescribed quantity, proved fatal to the foliage of the Tomato. Prof. E. Smith was asked if Tomatos and Potatos suffered in California, as here, with the same fungus, *Phytophthora infestans*. He replied that though Tomatos are grown in 103 acre tracts there is no disease to which they are subject, though Potatos are, if not to the same at least to an allied form of fungus.

Calochilus.—Mr. Ware sent a spray of this Australian Orchid. It has an erect oscillating and fringed lip, the column being declinate, and the whole flower a delicate mauve colour. Dr. Kränzlin observed that it is very difficult to cultivate, as the natural conditions of its native habitat cannot easily be supplied.

Pinus sylvestris injured.—Dr. Masters showed a drawing of a bough of this tree which he had observed at Boscombe. It had apparently been split longitudinally into three pieces. They, however, were reunited beyond the spaces injured. No cause could be assigned for the remarkable occurrence.

Dianthus attacked by Fungus.—Rev. W. Dod sent some specimens of different species attacked with fungi. They were sent to Kew for examination and report.

Æcidium on Paris quadrifolia.—Mr. Plowright forwarded specimens with the following communication: "During the present summer Mr. W. Thompson, of Carlisle, and I have been engaged in working out the life history of this *Æcidium*. The details of our work we hope shortly to publish. In the meantime it seems desirable to state briefly that we find the *Æcidium* on *Paris quadrifolia*, which occurs near Carlisle, is connected with a *Puccinia* allied to *P. sessilis*, *P. digraphidis*, and *P. Phalaridis*, which species, it will be remembered, have their *æcidiospores* on *Allium ursinum*, *Convallaria majalis*, and *Arum maculatum* respectively. The Carlisle *Puccinia* was found by us to germinate freely from the end of April till the middle of May. Applied to the above-named host plants it produced no result, but succeeded upon *Paris quadrifolia*, on which plant it gave rise to *Spermagonia* followed by *Æcidia*. The resulting

æidiospores were applied on June 10 to the foliage of *Phalaris arundinacea*, which in twenty days bore a *Uredo* with dark orange or reddish brown spores. Further details of our culture will be published shortly."

Cronartium ribicola.—He also sent specimens of this fungus, observing that they were gathered on July 3 in the garden of Mr. C. J. Boyes, Oakwood House, Setch, near King's Lynn. "For several years past I have been looking out for this fungus, but until the above-named day without success. It occurred on Black, White, and Red Currant bushes in both stages—viz. *Uredo* and *Teleuto* spores. The parasite was found sparingly in two gardens adjoining Oakwood House. Several Pines of various species are growing in these gardens, but the season is too advanced for the *Peridermium* to be encountered in its perfect stage." Dr. Masters observed that this disease on *Pinus Strobilus* has been known for several years, but it is only now that the fungus has been traced to its source on Currant bushes by Mr. Plowright.

Daisy, Monstrous.—Dr. Masters showed drawings of a very unusual form of flower, in which the ray-florets had cohered into a campanulate cup, the styles and stigmas uniting into a column.

Tsuga Pattoniana and *T. Hookeriana*.—He also showed branches of these trees, pointing out the differences, though regarded as the same species. Prof. E. Smith remarked upon the great differences which obtain between the maritime horizontal form of *Cupressus macrocarpa* and the erect fastigate inland variety. Mr. Henslow alluded to the fact that the *Deodar*, so different from the Cedar of Lebanon in habit in this country, resembles it in its native home on the Himalayas.

Carnations attacked by Hylemyia Grubs.—In response to the request for observations made by the Scientific Committee, "W. D." writes as follows to the *Journal of Horticulture*, July 14, page 33: "The earliest stage of the operations of the grub is to be seen about the early part of June, and any symptoms of decay in the main or lateral stems of the plant should be examined, when a very small yellow grub will be found, changing to a nut-brown colour as it gets older, eating out the heart of the stem, but it cannot be seen until the attacked part is cut away and examined. It also attacks the

young foliage and eats its way into the 'grass' (young leaf-shoots at the base of the plants), and any indication of curling or decay should lead to immediate examination. The grub ultimately turns to a small brown chrysalis about a quarter of an inch long. The only remedy is frequently and closely searching, examining, and hand-picking."

University Horticultural Education.—Professor Emory E. Smith gave an interesting account of the new Horticultural Department of the Leland Stanford Jr. University of California. He stated that this great University, which opened the 1st of last October, was located about thirty miles from San Francisco, in the heart of one of the largest fruit districts in the world, and had a first endowment of over £4,000,000. The endowment being ample, no fees are necessary, the education being practically free, students only having to arrange for board, books, and clothes. Belonging to the University there are about 40,000 acres of rich land, about 1,100 of which are already in bearing as vineyards, a considerable tract being orchard land. Immediately surrounding the University buildings there are 8,000 acres of rich land. Upon this is already located one of the finest stock-breeding farms in America. Something like 1,000 acres of this tract will be planted as orchard, and about 100 acres will be used for illustrative horticultural work of various kinds; 250 acres will be devoted to landscape gardening, and about 100 acres to botanical purposes. This is the first University in the world to elevate horticultural education to its true place of dignity among the arts and sciences, by making it one of the leading features of the institution. It will be noted that in this case horticulture has been severed from agriculture, and has been made entirely independent of other departments. Regular students from any part of the world, of sixteen years of age or over, can enter the University by passing a satisfactory examination. There is also a provision for the entry of special students of any age or degree of proficiency, without any fee or examination, but simply upon the recommendation of the professor in charge of the department in which he desires to work.

The one idea held in view by the Department of Horticulture is to harmonise and teach simultaneously the practice and theory of horticulture, and to make the subject so attractive that many will seek this class of education, and follow horticultural indus-

tries rather than those which at present are made educationally more alluring ; so that the brighter youths of the rural districts who now flock to the cities will rather be drawn towards rural pursuits than city professions. It is hoped, by thus aiming at the highest possible horticultural education, to elevate horticulture into a recognised position of equality with the most dignified arts and sciences. Degrees will be given in horticulture of equivalent value to those in other departments of the University, when the students have acquired the necessary proficiency. The first degree can be obtained by students in horticulture after four years' satisfactory work. After this three years of independent work are provided, giving the student every opportunity to make original investigations and conduct experiments, as well as follow out any line of practical work, thereby enabling him to earn still higher degrees. As an illustration of what we hope to do, a class will plant, say, 50 acres in orchard, and the students, before acquiring their first degree, will not only have budded and grafted the trees, but will have pruned and brought them into bearing, packed the fruit and shipped it, and kept accurate accounts of their operations.

Of course, at the same time that students are carrying on their practical work in the field, regarding which they have no discretion outside the directions of the professor in charge, they will be conducting their scientific studies, such as entomology, botany, geology, ornithology, zoology, agricultural chemistry, &c. The chief branches of the department (any special one of which students may follow out as a specialty for the three years after obtaining their first degree, and all of which have to be taken in the general course) are fruit culture, fruit preservation, vegetable growing, floriculture, and landscape gardening. One feature of this system of education is that each student must, at some period previous to taking his first degree, work for several weeks in one of the best nurseries, canneries, greenhouse establishments, &c., in the country, under the direction of the regular superintendents of the several establishments. This enables the student, upon taking his first degree, to decide which industry he may prefer to make the chief object of his three years' independent work and study. For the constant aim will be to teach the commercial aspect of every problem as thoroughly as the scientific and operative sides.

Special students who do not pass examinations will have every advantage in the class work ; and while they cannot secure degrees, they can earn certificates of proficiency, stating the length of time they have worked in the department, and the degree of excellence attained. We are inclined to inaugurate a system of examination quite different from that usually in vogue. The student will be required each day, or at frequent intervals throughout the terms, to give the day following the performance of certain practical or scientific operations, both a written and verbal account of the work accomplished. The excellence of these reports, and the general standing of the students in their classes throughout the year, will rather determine their fitness for acquiring degrees than the old-fashioned final examination. At present there are about 520 students at the University, and in October next there will be about 1,300 ; but in following years, when more buildings have been erected, the number will probably be more than doubled. A number of these students are entering, or preparing to enter, the horticultural department. It will be understood that the examinations in this University, and the mental attainments required of the student, are on a par with those of Oxford and Cambridge, and it will thus be seen that a bid is made for students of first-class ability. A large number of the first horticultural authorities in America have been consulted regarding the formation of this department of horticulture, and general satisfaction was expressed at the plans under which the work is and will be carried on. The students' expenses at the University need not exceed £5 per month, the charge for board and room being £4 per month, the actual cost to the University. Students who are industriously inclined can frequently work their way, and scholarships will be offered to those showing great progress in their studies.

This, it will be understood, is a very brief and general outline of the great work in hand, as it would take too long to develop the ideas and plans in detail.

A unanimous vote of thanks was given to Professor Smith by the members of the Scientific Committee for his most interesting account.

SCIENTIFIC COMMITTEE, JULY 26, 1892.

D. MORRIS, Esq., in the Chair, and five members present.

Termes at La Rochelle.—Mr. McLachlan having previously stated, at the meeting held on June 21, that the species in question was a native of the Old World alone, though Mr. Warburton is still under the impression that it was introduced to La Rochelle from America, he added the following observations: "Termes was first noticed at La Rochelle about 1789, and was supposed to have been introduced from St. Domingo, with which place there was much trade at that time. This erroneous idea evidently still exists at La Rochelle as a tradition, having been handed down from generation to generation. A much more probable explanation has been suggested, namely, that it was introduced into La Rochelle with firewood from Landes, where it is very abundant. Termes lucifugus has never been found in any part of North or South America, or in the West Indies. In geographical distribution it is essentially circum-Mediterranean, but extends into Spain, Portugal, and as far north as La Rochelle. I possess the insect from several localities on the European coasts of the Mediterranean, and also from Egypt and Algeria."

Dianthus attacked by Fungus.—Mr. Massee reported upon the specimens sent to the last meeting by Rev. C. W. Dod as follows: "The fungus is *Helminthosporium exasperatum*, Berk. and Br., and is present in various stages of development. As to whether the fungus is the *cause* of the disease or not it is impossible to say without experimenting on healthy plants. This I am now doing, and will report later. I may add that *Helminthosporium* has been shown to be the cause of disease in other cases."

Bouillie Bordelaise, Cause of its Failure.—The following communication was received from Dr. Russell:—"I send you now the result of my examination of the bouillie bordelaise used at Chiswick. Mr. Barron, I find, took 7 lbs. of sulphate of copper and 10 lbs. of quicklime; he slaked the lime in 10 quarts of water and dissolved the copper sulphate in 7 quarts of water, and afterwards diluted these liquids so as to make the total quantity up to 100 quarts. The clear solution from the lime was added to the sulphate of copper solution, and the precipitate allowed to

settle. The Tomatos were syringed with the clear liquid. The effect has been disastrous, the stems and leaves having in every case been burnt, and the lower leaves had to be removed. Some of the same solution falling also on Vine leaves produced red spots (burns). Now this solution, prepared as above described, was simply a dilute solution of sulphate of copper, containing about one ounce of sulphate of copper in the gallon ; so that the whole of the process for preparing the solution was entirely useless, and the product, viz. the hydrated oxide of copper thrown down by the lime, was allowed to settle and was not used ; in fact, if you had taken an ounce of copper sulphate and dissolved it in a gallon of water you would have got a solution of exactly the same kind as the one which was used. In the letter from M. Cornu, which you have sent me, I see it is stated that this hydrated oxide of copper is the active agent, and that the copper ought to be totally precipitated from the liquid. At the same time, I think that the nature and the preparation of this bouillie bordelaise has not generally been clearly stated and understood. I suppose I may assume that this hydrated oxide of copper is the substance which it is desired to prepare, but it will be a matter of the greatest importance as to whether it is suspended in a solution of sulphate of copper, or in lime water, or in pure water ; all of which cases are possible according to the proportions of the materials used. In the case of Chiswick there was a deficiency of lime, and hence the copper sulphate remained in solution. To get rid of the sulphate of copper, which appears to have acted so injuriously, the instructions should be to continue the addition of lime till the liquid just ceased to have a blue colour when a depth of 2 or 3 inches is looked through. I should think that the different results which have been obtained by different experimenters may be to a great extent accounted for by the want of an exact description of how the bouillie bordelaise was to be made and how it should be used."

The following are extracts from M. Cornu's letter received by Dr. Masters (from the Muséum d'Histoire Naturelle, Paris): "The proportions of the bouillie bordelaise vary from 3 to 4 kilogrammes of sulphate of copper, with 3 to 4 of quicklime, and 100 kilogrammes or litres of water [1 kil. = $2\frac{1}{2}$ lbs.; 100 litres = 22 gallons]. It is better to have less copper than lime, so that all of the former may be precipitated. The copper salt

must first be dissolved in water (10 litres), and the lime also separately in 20 litres; the two must then be mixed together. Under these conditions the copper is reduced to the state of a hydrated oxide, which is quite or nearly insoluble, and does not burn the leaves. The lime also effects a mechanical adherence of the copper salt to the surface of the leaves. The hydrated oxide of copper becomes soluble under the influence of organic acids contained in small quantities in the liquid in contact with the vegetative organs. There is an elective property in cellulose membranes for salts of copper, and the natural explanation which follows from this fact is: first, that the *Peronospora* is killed by the salt; and, secondly, that the spores cannot germinate upon leaves the membrane of which has imbibed the copper salt. Leaves which have thus received the mixture are not invaded by the *Peronospora*, while adjacent leaves are less easily attacked. It has been observed in Bourgoyne that the Vines were much less attacked by the *Peronospora*, the props of which had been treated with the sulphate of copper, than those not so treated. Hence it is advisable to soak all the objects which surround the plants, especially the props or supports, &c., in the bouillie bordelaise, as well as the walls, soil, pots, &c. The author finally suggests the trial of copper sulphide finely pulverised and scattered over the borders, plants, &c." With reference to this last-mentioned suggestion of M. Cornu, Professor Church observed that copper pyrites in fine powder suspended in mine water has been proved to be most injurious to young grass in water meadows. Free sulphuric acid and basic sulphate of copper and iron were produced, the acid being the chief destructive agent.

Black Rice from Burmah.—Professor Church announced his discovery of the occurrence of a red pigment in the grain of the Black Rice of Burmah. A sample of this remarkable variety of Rice was recently handed to Prof. Church for chemical analysis by the Director of the Royal Gardens, Kew. It was an imperfectly decorticated sample, most of the grains still retaining portions of the dark-coloured pericarp. Plunged into slightly acidulated alcohol the pigment dissolved with a magnificent crimson colour; and proved to be identical with one of the most widely diffused and best known of vegetable colouring matters. This is the compound represented by the empirical formula, $C_{20}H_{20}O_{10}$,

and known by various names, such as œnolin, anthocyan, erythrophyll, and colein. It occurs in Black Grapes and Black Currants, in the leaves of the Copper Beech, in the stems and leaves of *Coleus Verschaffelti*, in the florets of the crimson *Dahlia*, &c. It is soluble in alcohol, but insoluble in ether, and nearly so in pure water; and may thus be distinguished from carotin, which dissolves in ether; and from amarantin, which is soluble in water, but not in alcohol. It becomes purple, then blue, and finally green, or even yellow, by the action of alkalies. Its spectrum is quite characteristic. A full account of this pigment was published in the *Journal of the Chemical Society* for March 1877.

Figs diseased.—Mr. Barron sent some varieties of yellow Figs from Chiswick with dark green spots. Each spot proved to have a scale insect (*Mytilaspis ficus*) in it. The leaves were also affected, but these were neither damaged nor discoloured as was the fruit.

Verbascum fasciated.—Mr. Paul exhibited a fine specimen of this plant in this abnormal condition. Mr. Henslow observed that he had several very long fasciated stems of *Asparagus* this year, exceeding 6 feet in length and from 2 to 3 inches in breadth. He also added that he had raised a fasciated *Tropæolum* by seed for six years in succession. *A propos* of hereditary malformations, Dr. Masters wrote to say that although Dr. Hugo de Vries had succeeded in reproducing by seed the spirally twisted variety of the Teazle, yet plants raised by himself from seeds sent to him by Dr. Vries had grown quite normally.

Proliferous Mignonette.—A specimen of this monstrosity was sent by Mr. W. Treseder, Cardiff. It proved to be the same as one issued by Mr. W. Balchin, of Hassock's Gate, in 1881, and called *Reseda odorata* var. *prolifera alba*. It was described and figured by the Rev. G. Henslow in the *Journal of the Linnean Society*, vol. xix., p. 214, pl. 32. The peculiarity resides in the fact that every branch arises out of the centre of an abortive flower, and occupies the place of the pistil. Occasionally two branches arise out of the same flower. Each of the branches, especially the lower, may have lateral ones. These also in the same way rise out of the centres of similarly proliferous flowers. The plant, of course, cannot seed, but can be propagated readily by cuttings.

Vegetable Marrow malformed.—Mr. Henslow showed a specimen in which a lateral branch had flattened out, and was adherent to the side of a fruit some 5 inches in length. At the summit of the latter a leaf was given off, as well as another branch similarly adherent to a second fruit of about 2 inches in length. At the summit of this was also a leaf, together with a normal flower-bud. In addition to the last-mentioned youngest fruit there was also a second growing from the apex of the first or lowermost fruit. This was about 4 inches in length, quite free, and normal in character. By the side of this was a young branch with leaves, buds, and tendrils, all undeveloped, and apparently quite normal.

SCIENTIFIC COMMITTEE, OCTOBER 4, 1892.

Dr. M. T. MASTERS in the Chair, and nine members present.

Bouillie Bordelaise.—With reference to this preparation, Mr. Morris stated that it had been thought advisable by some persons to water the soil with it, and M. Cornu, as recorded in his letter read at the last meeting, appeared to favour this view. It was, however, the general opinion of the members present that this procedure would undoubtedly sterilise the soil, and so prove highly injurious by arresting nitrification. Some further discussion arose with reference to the best manner of knowing when the bouillie was in a proper state for application, as several failures in its use had resulted from the copper salt being still present in the solution. Dr. Russell, as recorded at the last meeting, appeared to rely upon the absence of a blue colour when 2 or 3 inches in depth of the clear fluid was looked through; another suggestion, made by Dr. Müller, being the application of a small quantity of liquid ammonia. If there be any copper present the bouillie would become blue. Professor Church remarked that although all the sulphate of copper might be changed into the hydrated oxide, yet if any small quantity of the latter be left suspended in the liquid, and not entirely precipitated, the blue colour would still appear on the addition of ammonia. The simplest and most efficacious test would be to place a piece of clean iron (*e.g.* a knife-blade free from grease)

into the solution for about five minutes ; then, if no film of copper were deposited on the iron it might be concluded that the mixture was in a proper condition for use. It was further added by Dr. Müller that great care is required in using the lime, as, if it were not most thoroughly pulverised in water, portions would not come into action at all. The lime, too, must be of the best quality, and not from a quantity which had been kept for any time exposed to the air.

Prevention of Smoke and Fogs.—Mr. Michael forwarded the following report upon Col. Dulier's process for the prevention of smoke and fogs :—

“As requested by the Committee, I have inspected Col. Dulier's apparatus at No. 51 Sloane Gardens. The process is especially applicable to domestic fires, including those of the ordinary English type. Shortly stated the process is as follows, viz. : Steam (not under pressure) is generated in a small special boiler behind the kitchen range, and is allowed to mix with the smoke in the flue ; it may be introduced either at the top or the bottom of the flue. The mixed smoke and steam does not pass through a chimney-pot into the open air in the usual way, but is conducted into a condenser on the roof of the house, which receives all the flues of the house. In this condenser the steam is condensed, and falls into very fine rain, thus washing the smoke and carrying down carbon, sulphurous acid, &c., the whole being carried off by a drain. It is claimed that the condensed steam carries down practically the whole of the free carbon, and also a third to a half of the sulphurous acid when the air temperature in the open is 50° Fahr. or above, and more than a half when the temperature is lower. It does not appear that any experiments have yet been made to ascertain what proportions of the other residual products of coal combustion are carried down. The process appears to me to be simple, automatic, and well worthy of further investigation and encouragement. A wet rag placed over the discharge aperture of the condenser, where the hot air and gases escape, is not blackened and does not collect soot, and the face may be held over the same aperture without any particular inconvenience being experienced. It is further claimed that the apparatus prevents the possibility of a down draught in the chimney, and also effects a considerable saving in fuel. The present apparatus at 51 Sloane Gardens

has been erected for the purpose of experiment and demonstration only, and would, I fear, be much too costly to be enforced for general use in small houses ; but it is the first made, and could probably be greatly simplified and reduced in cost. Col. Dulier would be happy to exhibit the apparatus to the Fog Sub-Committee on their applying to him at 27 Sloane Gardens. The apparatus used by the chemists who tested the absorption of sulphurous acid, &c., is still in No. 51 Sloane Gardens, and Col. Dulier would place it at the service of any chemist connected with this Society who might be inclined to make further investigations."

The thanks of the Committee were given to Mr. Michael for his report.

White Ants from La Rochelle.—Mr. McLachlan exhibited specimens of the *Termes lucifugus* received from La Rochelle, the injuries caused by them having been described at a previous meeting. They are small, being less than a quarter of an inch long, and in the larval condition.

Artichoke-Gall.—He also exhibited a specimen of a gall, probably produced by some species of cynips.

Cladosporium on Wheat.—Mr. Plowright sent specimens showing this disease, with the following communication: "During the last season this disease has been exceedingly common in the Wheat in various parts of England. No district has probably suffered more from it than the eastern counties. It is often present with us, but I have never seen it so abundant as this year. Whole fields were blackened by it, and many persons mistook it for Wheat mildew, with which, of course, it has no affinity. Until recently the *Cladosporium* was regarded as a saprophyte, but recent investigations show me that it can also exist as a true parasite. During the harvest the difference between Wheat mildew and the *Cladosporium* disease is very apparent, for where the last named is present to any extent the reaping machine is surrounded by a cloud of dust. There is nothing to prevent both fungi occurring in a Wheat crop simultaneously, but, of course, the mildew is not dusty. Prof. Eriksson, of Stockholm, a few years ago called attention to the prevalence of *Cladosporium* on Rye in Norway and Sweden, and pointed out that it all occurred on the grain ; and further, that when the diseased Rye was consumed it gave rise to a series of symptoms, among which were diarrhœa,

vomiting, and especially derangement of nerve centres, producing dizziness and a staggering gait, like that of a drunken man. The grain of Rye, being less covered by the chaff, is more liable to have the fungus upon it than is the case with the Wheat. Prof. Woronin last year was called upon by the Russian Government to investigate a series of cases in which the above-named symptoms were produced by its consumption. He came to the conclusion, however, that the poisonous properties were induced rather by *Fusarium roseum* than by the *Cladosporium*, although the latter was very abundant on the affected grains. As will be seen from the specimens sent, the *Cladosporium* is especially abundant on the chaff. Such a development of parasitic life cannot but be detrimental to the Wheat affected by it, and it is probable that the *Cladosporium* has much to do with the poor yield so many agriculturists complain of this year. This is a subject which the Agricultural Department should inquire into at once."

Cronartium ribicola.—Mr. Plowright also sent specimens of *Pinus Strobus* attacked by the æcidiform stage of this fungus, with the following communication: "At a recent meeting of the Scientific Committee specimens of this fungus on Currant leaves were exhibited, gathered in the garden of Mr. C. G. Boyes, Oakwood House, Setch, near King's Lynn. On the 13th of August I again visited the garden and examined the Pines, in order to find if possible the branches affected by the *Peridermium*. This I was successful in doing, and herewith send one of the affected branches. It will be seen that the mycelium of the *Peridermium* has caused hypertrophy of the affected branch. The peripheral extremity bears a sickly tuft of foliage, but the branch itself is evidently dying, although at its base it shows the enlargement due to the mycelium extending downwards. There are two trees affected about fifteen yards from the Currant bushes. I have also observed the *Cronartium* on Currants in the garden at Middleton Rectory." A vote of thanks was given to Mr. Plowright for his interesting communications.

Green-fruited Elder.—Mr. Henslow exhibited sprays of this rare form of the common Elder from a tree in his garden at Ealing. The foliage differs from the common form in being darker in colour, the two halves of a leaflet approximating each other as in the Portugal Laurel, the marginal teeth being curved

forwards, whereas in the common form the leaf is paler green, the leaflets are flat, and the teeth straighter. The berries of the green variety are globular with ten veins, resembling Currants, the ordinary form being oblong and black. The taste is the same in both.

SCIENTIFIC COMMITTEE, OCTOBER 18, 1892.

Dr. M. T. MASTERS in the Chair, and eight members present.

Bouillie Bordelaise.—A communication was received by Mr. Blandford from Mr. E. D. Till, The Priory, Eynsford, Kent, stating that of twenty-six experiments, in gardens, fields, and allotments, on different sorts of Potatos this season, they were all completely successful. The mixture used consisted of 1 lb. of copper sulphate, 1 lb. of freshly slaked lime, 1 lb. of syrup, and 5 gallons of water. The following are some of the more striking results selected from Mr. Till's report: " 'Early Puritan,' once, twice, and thrice syringed respectively, all were good; the haulm being green four weeks after the others had decayed. When not syringed 25 per cent. were bad. 'Wilford Park,' considered a good disease resister; of seven rows not syringed 5 per cent. only were bad. Of a row twice syringed all were good, cleaner, and of a more regular size than the others. Of 'Sutton's Abundance,' 20 to 25 per cent., 'Victory,' 20 per cent., and 'Chancellor,' 3 per cent. were bad when not syringed. 'Reading Giant,' when twice syringed, were all good, with more than a fourth excess of crop; all being cleaner and of a more regular size than in the rest of the field, where it gave an average crop. The haulm was green to September 25, six weeks after the others had decayed. Of seven varieties grown on allotments, of 'Snowdrop,' twice syringed, all were good; once syringed, eight tubers bad; not syringed, sixteen bad. Of 'Early Puritan,' twice syringed, twenty-five tubers bad; about sixty being bad on two adjacent rows not syringed. In a garden, 'Beauty of Hebron,' once syringed, all were good and very clean; while of two rows not syringed 30 per cent. were bad." Mr. Till concludes his report with the following general remarks: "The leaves were very thoroughly syringed on both surfaces, and at a date (July 1, 15, or 20 to 23) when growth had nearly attained

its full development. The quantity applied at the rate of about 350 gallons per acre. The most striking results were on the early sorts. The later sorts were freer from the disease. The 'Reading Giant' plot showed a largely increased quantity in comparison with the adjoining rows, while the superior size, regularity, and quality were very marked. Also the 'ware,' or selling sizes, were very much more regular. This was no doubt due to the haulm being kept in vigour for five to six weeks after the rest of the haulm in the field had withered. There is no mistake about the great advantage of the solution when applied to this variety; improved growth was not so marked in other sorts, though certainly very noticeable generally." Prof. Church remarked that the use of the syrup was to make the hydrated oxide of copper more adhesive to the leaves, and he observed that dextrine had been used in conjunction with sulphuretted mixtures for Roses and Chrysanthemums; but the special value of sugar was that it entered into combination with the lime, and was subsequently set free, retaining all its adhesive properties. Mr. Blandford added that the use of sugar had been adopted as the best result from a large series of experiments carried out in France.

Docks attacked by Grubs.—Dr. Masters received a communication from Perthshire together with specimens of grubs which had attacked some Docks. As Rhubarb was about to be placed on the same ground, being of the same family (Polygonaceæ), it was thought the latter might be attacked also. It proved to be the "Ghost Swift," *Hepialus humuli*; but, as Mr. Blandford observed, this insect is so very generally distributed that no remedy could be suggested other than the destroying the plants with the grubs as much as possible.

Walnuts imperfect.—Mr. Noble sent specimens of Walnuts, in which the shell was imperfectly developed in certain places, though the kernels appeared to be sound. It was suggested that the cause might be defective root action from a clay soil, or perhaps the sharp frost in June when they were very young.

Fog Report.—Some discussion arose as to the desirability of recommencing observations on the injuries to plants by fog during the coming winter, and pursuing them in a systematic way. It is proposed, therefore, to reconsider the programme drawn up in 1891 at the next meeting of the Scientific Committee,

especially in its bearings on the best practical methods of resisting the injuries of fogs in the construction or adaptation of plant-houses or otherwise.

Peat-wood.—Dr. Russell showed some specimens of wood from a peat bed of a few feet in thickness on Dartmoor, in Devonshire, where there are no trees at the present time. One was that of Birch, but the other was not recognisable on inspection. It was referred to Kew for comparison with some museum specimens.

Fasciate Holly.—Mr. G. Paul sent boughs of *Ilex donningtonensis* with this peculiarity. It appears to be a variety particularly liable to fasciation. The cause of fasciation is still unknown among trees. It is particularly common in the Ash and Cotoneaster.

Cunonia capensis.—Flowering sprays of this shrub were sent by Mr. Burbidge. He observes that it is an old plant, but not often to be seen in gardens at the present time.

Pelargonium Sport.—A new double variety was received from Mr. Cannell called "Double New Life," having the peculiarity of the petals being white, red, and flaked in the same blossom. It originated from a double *Vesuvius* called "Wonderful." A flaked variety of the single *Vesuvius* appeared in the Isle of Wight in 1888. It has also sported to a salmon colour, as well as white, several times. The leaves are peculiar in having acquired almost a purple tint. The original *Vesuvius* was raised by Messrs. A. & F. Smith, of Dulwich, in 1868.

Egyptian Figs.—Mr. Henslow exhibited an instrument used in Egypt for cutting off the tops of the nearly ripe fruit of the Sycamore Fig. It consists of a circular strip of iron, one edge being sharpened, and inserted like a loop at the end of a stick. The object is to allow the insects to escape (*Sycophaga crassipes*, Westw.), which always infest that species. The Sycamore Fig is never propagated by seeds in Egypt. The custom is apparently very ancient, and the Hebrew word translated "cultivator" as applied to the prophet Amos (ch. vii. 14) really signifies "scraper," as correctly given in the Septuagint version (written at Alexandria). It is described by Theophrastus and Pliny, but no mention is made of the insects. As the fruit becomes sweeter it was thought to ripen them.

SCIENTIFIC COMMITTEE, NOVEMBER 1, 1892.

Dr. M. T. MASTERS in the Chair, and ten members present.

Injuries to Plants by Fog.—Dr. Russell observed that with reference to carrying out any experiments, the subject must be regarded from two points of view. Firstly, the object would be to make an exhaustive investigation into the action of fogs upon plants. This, to a considerable extent, the Scientific Committee has already done, as shown in Prof. Oliver's published report,* and in a second upon which he is now engaged. Secondly, taking a wider aspect of the subject, the points which would have to be considered would be the composition of fogs in general, their origin and extent, their comparative densities, the amount of sulphurous acid, the consequent diminution of light, &c. Such investigations would lead to the more universally important consideration as to the increasing unhealthiness of London in winter. To carry out this extensive programme would necessitate the selecting several stations, involving continuous observations, both during fogs and in clear weather. The whole would require a staff of paid analysts. Dr. Russell then gave some interesting statistics of observations carried out at Manchester by Dr. Bailey, which will in due time be published. One point to which he alluded may be here mentioned—namely, the amount of chlorides contained in "fog collections" washed out of the air. He himself had found a dense precipitate of chlorides even on Dartmoor, whenever sea breezes blew in that direction. *A propos* of this, Prof. Church remarked that he had on one occasion detected 7 grains of salt per gallon at Cirencester, which was about thirty-five miles from the sea. It is evident, then, that the presence of chlorides does not necessarily always indicate the presence of sewage. Prof. F. Oliver observed that, regarding the injuries from a horticultural point of view, the question as to the best means of preventing the action of fogs was most important. He described three methods. The first, with which he was very favourably impressed as to its efficiency, although it would probably prove to be the most difficult and expensive, was as follows: The primary condition for success

* "The Effects of Urban Fog upon Cultivated Plants," by Prof. F. W. Oliver, D.Sc., F.L.S. *Journ. Roy. Hort. Soc.*, vol. xiii., p. 139.

is that the plant-house must be air-tight. As glass houses, however, are usually and purposely constructed with air spaces beneath the overlapping glasses, these would have to be stopped up. In a house properly constructed, like that erected by Mr. Toope, the external air entered below, and was passed through boxes containing charcoal. A draught is created by the heated air of the house, which escapes at the top by means of exhaust caps, which allow of the passage of air *from* but not *into* the house. No sulphurous acid whatever then succeeded in passing through the carbon into the house, the filtration appearing to be perfect. A second method suggested was by means of sprays of various kinds, and by sprinkling the floors, &c. This method has its disadvantages, and Prof. Oliver did not express a favourable opinion of it. The third plan is simply to spread canvas over the house during the period of the fog to prevent its passing through the cracks and into the house. Of course the stoppage of light might be, in some circumstances, a serious objection, but not greater than that occasioned by the fog itself. The really injurious element of fogs is undoubtedly the sulphurous acid gas, and this has to be specially combated. A discussion followed as to what steps should be taken by the Society in the matter. It was generally felt that, as far as the Scientific Committee were concerned, they could not do more than undertake the first object mentioned by Dr. Russell; and this has, in fact, been done. The second and wider object, however, is more or less directly concerned with the former, though it may have a much wider scope. It was proposed, therefore, to make a statement as to what the Royal Horticultural Society has already done in the matter, and to invite the co-operation and assistance of other societies, such as the Meteorological; finally, to appeal to the County Council to take steps towards carrying out a more extensive investigation than the small funds at the Society's command alone could possibly accomplish.

Termes lucifugus.—Mr. McLachlan corrected an error in the description of the white ant of La Rochelle, as to the size of the larvæ, in that they are really smaller than stated, being less than a quarter of an inch in length.

Artichoke-Gall.—Mr. McLachlan also exhibited a specimen of this disease on the Oak, alluded to at a previous meeting. It is produced by *Aphilotrix fecundatrix*, of which the agamic generation is known as *Andricus noduli*.

Calathea Allouya Tubers.—Mr. Morris stated that the tubers exhibited by him at a meeting in June 1891, and supposed to be of a species of *Kämpferia*, now proved to be derived from the above-named plant, an old Carib food plant. The description and chemical constitution ascertained by Prof. Church will be found in *Journ. Roy. Hort. Soc.*, vol. xiii. 1891, pp. lix. and cviii.

Conifers.—Dr. Masters exhibited a branch of *Pinus Pinaster* with erect cones instead of their being reversed. He mentioned that he had once noticed a similar occurrence in the Scotch Fir at Zermatt, Switzerland. The former had been described as a new species with the name *Lemoniana*; but it merely represented a retention of the youngest condition of the cone. *P. ponderosa*.—He showed cones of this tree, which are peculiar in having the scales deciduous from below upwards, as occurs in *Abies*. *Pinus excelsa*.—He also exhibited a branching cone of this tree.

Pyrus japonica Fruit.—Mr. Read sent Apple-like fruits of this plant remarkable for their large size, being 7 inches in circumference and $2\frac{1}{2}$ in height, and very symmetrical in form. They were grown against a sunny wall in Ealing.

The "Glassiness" Apple.—A specimen of this translucent Apple was sent from Naples by Signor Piperno, where it is considered one of the best eating Apples in Italy. Prof. Ward examined and described it on a previous occasion. (*Journ. Roy. Hort. Soc.*, vol. xii., 1890, p. clxvi.)

SCIENTIFIC COMMITTEE, NOVEMBER 15, 1892.

Mr. McLACHLAN in the Chair, and ten members present.

Injury to Plants by Fog.—In accordance with the proposal of the Scientific Committee made at the last meeting, the Council of the Royal Horticultural Society have passed the following resolutions in reference to the investigation of the nature and injuries to plants by fogs:—

"1. That the Royal Horticultural Society, through its Scientific Committee, having devoted considerable attention to the effects of London fogs on cultivated plants, is of opinion that the increasing prevalence of these fogs is causing great inconvenience and loss

to horticultural interests within the metropolitan area; and as these interests are associated with one of the largest and most important enterprises of plant cultivation under glass carried on in any part of the world, it is a matter of the greatest importance that the circumstances connected with the chemical compositions of these fogs, their origin and extent, the amount of sulphurous acid contained in them, as well as the diminution of light caused by them, should be carefully and exhaustively investigated.

“2. This Society, being also of opinion that London fogs are detrimental to public health, and are calculated to render London an undesirable place of residence for many months of the year, as they interfere with trade and public business, and cause serious loss to the community generally, invites the co-operation and support of kindred societies and all organisations interested in the subject, in a representation to the London County Council to institute an inquiry into the causes and circumstances of these fogs, with the view of reducing their injurious character, or if possible removing altogether the causes which have led up to them.”

On the suggestion of the Scientific Committee, the Council agreed to set apart one of the propagating pits at the Chiswick Gardens for the purpose of carrying out experiments during the current winter to mitigate the effects of fogs on cultivated plants. It was also agreed to inform the Chiswick Board of this arrangement, and to request the Superintendent to give what assistance he could in carrying out the suggestions of the officers placed in charge of the experiments.

Dr. Russell stated that he thought it would be of great importance with regard to the fog question if a comparative and simultaneous series of determinations of the amount of light could be carried out at once, both in the City and outside London, in order to thus obtain a more exact idea of the enormous loss of light experienced in the City during the winter months. With the object of familiarising himself with the method adopted by the Manchester Committee, he was experimenting with their process.

Garden Labels.—Mr. Morris remarked on the difficulty of finding any material suitable for labels. They had tried a great variety at Kew, but the best, in being most durable, was a strip of lead with the name stamped upon it. He exhibited a sample

from the garden of A. Cushney, Esq., Pains Hill Park, Cobham, dated 1774, on which the name "White Magdalen Peach" appeared to be as sharply indented as at first. It is said, however, that the lead of the present day, in consequence of its being purer through desilverisation, would probably not last so long.

Lilium auratum.—Mr. Wilson mentioned that a single bulb of this plant in his garden had thrown up eight flowering stems. When dug up it was found to have developed seven good, well-formed and large bulbs. It grew in a good vegetable and loamy soil.

Wellingtonia with Fungi.—Specimens of fallen leaves and shoots of this tree were sent from the gardens, Orton Hall, Peterborough, with numerous small white agarics growing upon them. It proved to be *Mycena hyemalis*, Osbeck.

Alder Leaf perforated.—Mr. Wilks showed a dead leaf of Alder, very symmetrically perforated with two series of holes. It was most probably due to a sudden chill on the expansion of the buds in spring. A similar occurrence is not infrequent in Horse Chestnut and other leaves from such a cause.

SCIENTIFIC COMMITTEE, DECEMBER 13, 1892.

Dr. M. T. MASTERS, F.R.S., in the Chair, and five members present.

Garden Labels.—With reference to the value of leaden labels, Dr. Masters observed that some of the same date (about 1770) as of those described at the last meeting were still hanging on the walls at Gunnersbury Park. Dr. Bonavia observed that in India he had found porcelain or china labels, having the names burnt in, to be most serviceable.

Picea Morinda (Abies Smithiana).—Professor Church observed that a fine tree existed at Shelsley Court, Worcestershire, and was about 120 feet in height in 1849. This species was introduced from Kamaon in 1818 by Dr. Govan, who sent cones to the Earl of Hopetoun, and from which six seedlings were raised (Veitch, Man., p. 79). Whether the Shelsley Court tree was one of these, or had been introduced earlier, as seems probable, is not known.

Malformed Orchid.—Mr. O'Brien sent a flower of *Cypripedium Chamberlainianum*, having one of the petals standing above the labellum in the place of a sepal, a not uncommon occurrence.

Arbutus procera.—Flowering sprays of this species were sent by Mr. G. Lee from trees, of which there were three, stretching for a length of about 22 feet each; at one foot from the ground, the trunk of one was 3 feet 6 inches in circumference. The trees were planted about forty years ago. They flower profusely, but never bear any fruit. Mr. Lee observes that this species is not cultivated so often as it deserves to be.

Grindelia inuloides (*Bot. Mag. t. 3737*).—A flowering stem of this plant was forwarded by the Rev. C. W. Dod.

Peas attacked by Mites.—A specimen of earth containing mites, which have proved injurious to Peas, was received from Mr. McDonald, of Jura Forest, Greenock. They were forwarded to Mr. Michael for further examination.

Dendrobium Findlayanum, *Branched Pseudo-bulb* of.—Sir Trevor Lawrence sent a bifurcating branch of this Orchid. He observes that "Dendrobium bulbs often make side-shoots from the 'eyes' at the apex of each segment; but this example seems to be a true bifurcation, due, it would appear from the bend in the branch, to some arrest of growth by a wire or another bulb." A microscopical examination appeared to confirm the above view, for the stem was single at the base, but a slight constriction began on one side, then a second appeared on the opposite side higher up, until they deepened and met, thereby dividing the single stem into two.

FRUIT COMMITTEE.

JANUARY 12, 1892.

PHILIP CROWLEY, Esq., F.L.S., in the Chair, and eighteen members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Geo. Bunyard & Co., Maidstone, for a collection of 100 varieties of Apples and Pears in remarkably good condition.

To Messrs. Deverill, Banbury, for very large and fine examples of the following varieties of Onions: Royal Jubilee, Rousham Park, Advancer, Anglo-Spanish, The Lord Keeper, Improved Wroxton, Cocoanut, and Ailsa Craig.

Award of Merit.

To Apple Albury Park Nonesuch (votes, unanimous), from the Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach). A large and fine showy fruit, stated to have been grown in the neighbourhood for over a hundred years.

Other Exhibits.

Mr. Leach sent some examples of Mrs. Pearson and Gros Colmar Grapes.

The Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), sent a dish of Tomatos.

Mr. A. Dean, Kingston, sent examples of imported Apples, King of Tomkins County, for comparison with home-grown fruit of the same variety supplied by Messrs. Bunyard. The home-grown fruit proved to be superior in quality to the imported.

The Rev. W. P. Holmes, Paston Rectory, Peterborough, sent a handsome seedling Apple.

Mr. T. Moone, Seymour Cottage, Sutton, sent a seedling Pear named Thorncroft, which greatly resembled the old Morrell, and was of no particular merit.

FRUIT COMMITTEE, FEBRUARY 9, 1892.

PHILIP CROWLEY, Esq., F.L.S., in the Chair, and twenty-two members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To A. H. Smee, Esq., Carshalton (gardener, Mr. G. W. Cummins), for 100 dishes of remarkably fine Apples and Pears.

Silver Banksian Medal.

To Messrs. Cheal & Sons, Crawley, for a collection of 69 varieties of Apples and Pears.

To Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), for 30 dishes of Apples.

Award of Merit.

To Apple May Queen (votes, 10 for, 8 against), from Lord Beauchamp, Madresfield Court, Great Malvern (gardener, Mr. Crump).

Cultural Commendation.

To the Duke of Northumberland, Albury Park (gardener, Mr. W. C. Leach), for a basket of remarkably fine Mushrooms.

Other Exhibits.

From the Society's Gardens was sent a seedling Apple raised by Col. Clarke, which was considered very promising.

From the Duke of Northumberland, Albury Park, again were sent examples of Apple Albury Park Nonesuch.

Mr. G. Evans, Gortmerron House, Dungannon, sent fruit of an Apple to be named. It was considered to be the Pomme Grise of France.

Lord Wimborne, Canford Manor (gardener, Mr. Crasp), sent examples of Lillywhite Seakale, which was referred to Chiswick.

Mr. P. McArthur, Maida Vale, sent examples of a new tying material named "Taroba."

Lord Foley, Ruxley Lodge, Esher, sent some good examples of Mushrooms.

FRUIT COMMITTEE, MARCH 8, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and twenty-one members present.

Awards Recommended:—*Award of Merit.*

To Apple Improved Ashmead's Kernel (votes, unanimous), from Mr. J. Watkins, Pomona Farm, Withington, Hereford. Stated to be a better bearer than the ordinary variety.

Cultural Commendation.

To Mr. W. Poupart, Twickenham, for four baskets of particularly well-grown Seakale.

Other Exhibits.

J. T. Hopwood, Esq., Ketton Hall, Stamford (gardener, Mr. W. Divers), sent some very large and fine-looking fruit of three

varieties of Oranges grown in Florida, named Brights, Russets, and Navel. The two latter were considered to be very good. Mr. Divers stated in a letter that the russetting of the fruits is attributed in Florida to the action of insects, but Mr. Divers was of the opinion that exposure was the chief cause—the Russets being gathered from the exposed parts and the Brights from the interior of the trees.

Sir T. Farrer, Abinger Hall, Dorking (gardener, Mr. W. Payne), sent some very fine highly coloured fruit of Annie Elizabeth Apples grown on a sandy soil.

Messrs. J. Veitch & Sons, Chelsea, sent examples of two seedling Apples named St. David's and Welsh Beauty.

The Duke of Northumberland, Albury Park (gardener, Mr. W. C. Leach), sent some Tomatos named Ladybird; and Onion Maincrop.

FRUIT COMMITTEE, MARCH 22, 1892.

PHILIP CROWLEY, Esq., F.L.S., in the Chair, and eighteen members present.

Awards Recommended:—

Award of Merit.

To Orange Silvermere Seedling (votes, 8 for, 6 against), from C. E. Smith, Esq., Silvermere, Cobham (gardener, Mr. Quarterman). Fruit of large size, deep orange colour, and richly flavoured.

Other Exhibits.

Baron Schröder (gardener, Mr. Ballantine) sent some highly coloured fruit of a Crab Apple found growing in a hedge.

Messrs. J. & M. Poupart, Mortlake, sent some remarkably fine Asparagus.

The Duke of Northumberland, Albury Park (gardener, Mr. Leach), sent some ripe Tomatos named Ladybird.

Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), sent some fine Mushrooms.

H. Packe, Esq., Prestwold, Loughborough (gardener, Mr. D. Roberts), sent two Cucumbers, the results of a cross between Barton's Prolific and Lockie's Perfection.

FRUIT COMMITTEE, APRIL 12, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and twenty-seven members present.

Awards Recommended:—*Cultural Commendation.*

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for Strawberry Vicomtesse Héricart de Thury, and a new seedling variety.

Other Exhibits.

Two Cucumbers were submitted by the Duke of Northumberland's gardener, Syon House.

The Marquis of Exeter, Burghley, Stamford (gardener, Mr. Gilbert), sent examples of Tomato Gilbert's Satisfaction, a variety found very useful for winter use.

FRUIT COMMITTEE, APRIL 19, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and sixteen members present.

Awards Recommended:—*Cultural Commendation.*

To the Marquis of Exeter, Burghley (gardener, Mr. Gilbert), for a very fine dish of Strawberry La Grosse Sucrée, a variety which was stated to force well.

To Mr. Frank Lees, The Vineyard, Connaught Road, Reading, for a large box of Strawberry Vicomtesse Héricart de Thury, of remarkably fine appearance.

Other Exhibits.

The Duke of Northumberland, Syon House (gardener, Mr. Wythes), again sent examples of a Strawberry named Syon House Keens' Seedling. The Committee requested Mr. Wythes to send plants to Chiswick, to be grown for comparison with Reeves' Eclipse.

Mr. O. Thomas, The Royal Gardens, Frogmore, sent fine examples of Grapes Black Hamburg and Foster's Seedling, ripened in March.

J. T. Hopwood, Esq., Ketton Hall, Stamford (gardener, Mr. Divers), submitted examples of Apple Barnack Beauty, fresh and good.

W. Roupell, Esq., sent a collection of well-kept Apples.

FRUIT COMMITTEE, MAY 3, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and twenty-three members present.

Awards Recommended :—*Silver Knightian Medal.*

To Her Majesty the Queen, The Royal Gardens, Frogmore (gardener, Mr. O. Thomas), for a large and comprehensive well-grown collection of vegetables, viz. Cucumbers, Leeks, Celery, Asparagus, Tomatos, New Potatos, Seakale, Broccoli, Cottager's Kale, and well-hearted Cabbages ; and in addition a box of very fine Strawberries, La Grosse Sucrée.

Cultural Commendation.

To Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), for a dish of very handsome Strawberries, Laxton's Noble.

To Lord Foley for some fine Mushrooms.

To the Duke of Northumberland, Syon House (gardener, Mr. Wythes), for Brown Turkey Figs.

Other Exhibits.

Lord Foley (gardener, Mr. Miller) staged 15 varieties of Apples, in remarkably fresh condition, which had been kept in a cool, dark cellar. The same exhibitor also sent Gilbert's King of the Cucumbers.

Mr. W. H. Castle, Castlemount, Twyford, sent two Cucumbers, raised between Sutton's Prizewinner and Lockie's Perfection. Very handsome form, and deep green colour.

The Duke of Northumberland, Albury Park (gardener, Mr. W. C. Leach), sent Lettuce Veitch's Perfect Gem, with large close hearts. Considered forward for the season.

John Lee, Esq., Kensington, exhibited a punnet of ripe Plums imported from Sydney. The examples were wonderfully fresh and sound, the "bloom" still remaining upon them.

FRUIT COMMITTEE, MAY 17, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and eighteen members present.

Awards Recommended :—*First Class Certificate.*

To Melon Gunton Orange (votes, unanimous), from Lord

Suffield, Gunton Park, Norwich (gardener, Mr. Allan). Fruits of medium size, almost round, green-fleshed, skin pale yellow, and of first-rate quality. This was raised from Austen's Incomparable, double crossed, and is of a very distinct character.

To Strawberry Empress of India (votes, unanimous), from Lord Suffield. Fruits of medium size, pale-coloured, of a very rich and pleasant flavour; particularly recommended for pot culture.

Other Exhibits.

From Lord Suffield also came fine examples of the new Strawberries Gunton Park and Lord Suffield, which received certificates in 1891 (July 21).

Some very fine Strawberries, John Ruskin, were shown by Mr. R. Orlebar, Hinwick House, Wellingborough.

R. Burrell, Esq., Westley Hall, Bury (gardener, Mr. A. Bishop), sent a Melon named Westley Surprise.

The Duke of Northumberland, Syon House, sent a dish of fine Brown Turkey Figs.

T. Richards, Esq., Christchurch, sent some Tomatos.

FRUIT COMMITTEE, MAY 25, 1892.

INNER TEMPLE GARDENS.

P. CROWLEY, Esq., F.L.S., in the Chair, and twenty-three members present.

Awards Recommended :—

Silver Knightian Medal.

To Messrs. Veitch & Sons, Chelsea, for a collection of 80 dishes of well-kept Apples.

To A. H. Smee, Esq., Carshalton (gardener, Mr. Cummins), for a well-kept collection of Apples and Pears.

First Class Certificate.

To Apple Amorel (votes, unanimous), from Colonel Archer Houblon, Welford Park, Newbury. A medium-sized flat fruit of first-rate quality as a late dessert variety.

To Cucumber Success (votes, unanimous), from Mr. Mortimer, Swiss Nursery, Farnham, the result of a cross between

Express and Prizewinner. Fruits long, of fine even shape, and of a fine deep green colour.

Cultural Commendation.

To Mr. W. Armstrong, Winchcombe, Gloucester, for a dish of well-grown Peaches.

To Messrs. W. & E. Wells, Hounslow (gardener, Mr. Thompson), for a basket of Sir Charles Napier Strawberries.

To T. L. Mansell, Esq., 2 Somerset Terrace, Guernsey, for a basket of Muscat Grapes.

Special Awards.

Silver Cup.

To the Marquis of Salisbury, Hatfield (gardener, Mr. Norman), for six dishes of large and remarkably fine Strawberries, and six plants in pots laden with fine fruit. A most meritorious exhibit.

To Messrs. Rivers & Son, Sawbridgeworth, for an extensive collection of fruit-trees in pots—Nectarines, Peaches, Cherries, Plums, Pears, and Oranges—all heavily laden with fine large fruit, and growing with the utmost luxuriance.

Other Exhibits.

The Hon. Miss Winn, Nostell Priory (gardener, Mr. Easter), sent a dish of Figs.

Messrs. Sutton & Sons, Reading, exhibited six fine Melons.

Mr. Mortimer, Swiss Nursery, Farnham, staged a large collection of Cucumbers and Tomatos.

Mr. Burton, Upton Court, Slough, exhibited a brace of Lockie's Perfection Cucumbers.

Mr. C. Beckett sent examples of a Lettuce named Harbinger. Heads large, loose.

FRUIT COMMITTEE, JUNE 7, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and fourteen members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. de Rothschild, Gunnersbury (gardener, Mr. J. Hudson), for a dish of beautiful Lord Napier Nectarines.

Award of Merit.

To Peach Amsden June (votes, unanimous), from the Duke of Northumberland, Syon House (gardener, Mr. Wythes).

To seedling Melon Ritchings' Perfection (votes, 9 for, 5 against), from Dr. Frankland, F.R.S., Reigate Hill, Surrey (gardener, Mr. Ritchings).

Cultural Commendation.

To A. Pears, Esq., Spring Grove, Isleworth (gardener, Mr. Debnam), for Peach Dr. Hogg.

Other Exhibits.

Melons were shown by Mr. Frisby, gardener, Warden Hall, Preston; Mr. Bowerman, Hackwood Park; F. W. Drake, Esq., Shardeloes, Amersham; and Mrs. Heavers, Henley-on-Thames.

Mr. Wythes sent from Syon House a bunch of Early Milan Turnips.

From the Society's Gardens, Chiswick, came examples of Ryder's Perfection Rhubarb, also of the Victoria, with which it was considered identical; five varieties of Spinach, which were all very similar in appearance when cut, the variety named "Longstanding" being the most distinct as well as the latest in running to seed.

Cecil H. Hooper, Esq., Beckenham, exhibited an interesting and excellent set of diagrams on fruit culture and insect pests.

FRUIT COMMITTEE, JUNE 21, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and fifteen members present.

Awards Recommended:—*Silver Banksian Medal.*

To Mr. T. Sharpe, Royal Strawberry Gardens, Virginia Water, for 50 baskets of Strawberry Marguerite of great excellence. This variety is largely grown for late supply under glass by the market growers.

First Class Certificate.

To Strawberry Royal Sovereign (votes, unanimous), from Mr. T. Laxton, Bedford. Fruits of medium size, conical, bright scarlet, richly flavoured, second early.

Cultural Commendation.

To the Duke of Northumberland, Syon House (gardener, Mr. Wythes), for several dishes of Cherries.

Other Exhibits.

Mr. T. Laxton sent, in addition to the Royal Sovereign Strawberry (certificated), examples of Strawberry Scarlet Queen, an early, medium-sized, conical fruit, bright scarlet, and richly flavoured; also Strawberry Sensation, a large, roundish fruit of a very dark colour, with rather soft flesh and with little flavour.

Lord Wimborne, Canford Manor (gardener, Mr. Crasp) sent some nice examples of Peaches and Nectarines.

Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), sent a basket of Strawberries and some excellent Mushrooms.

Mr. Allen, The Gardens, Swallowfield, Reading, sent 12 very handsome Melons.

Seedling Melons were also shown by J. H. Kitson, Esq., Elmet Hall, Leeds; Mr. S. Eley, Henley-on-Thames; and Mr. G. Reynolds, gardener to Messrs. de Rothschild, Gunnersbury Park, Acton.

Mr. Lowe, Uxbridge, sent a Cucumber named Lowe's Advancer.

Messrs. R. Veitch & Sons, Exeter, sent a dish of Exonian Peas, a variety stated to be of very fine quality.

FRUIT COMMITTEE, AT CHISWICK, JULY 7, 1892.

W. WARREN, Esq., in the Chair, and nine members, with
M. Vilmorin, of Paris, present.

Awards Recommended:—

First Class Certificate.

To Pea Duke of York (votes, unanimous), from Messrs. Cooper, Taber & Co., Rivenhall, Essex. An early selection of Duke of Albany, with somewhat smaller pods.

The collection of Peas growing in the Garden were examined, the following varieties being Highly Commended:—

Highly Commended (× × ×).

Alderman, from Mr. T. Laxton, Bedford.
 Boston Hero, from Messrs. Bunyard & Co., Maidstone.
 Consummate, from Mr. H. Eckford, Wem, Salop.
 Duke of Albany, from Messrs. Veitch & Sons, Chelsea.
 Duke of Rutland, from Messrs. Harrison & Sons.
 Essential, from Mr. H. Eckford, Wem, Salop.
 Exonian, from Messrs. R. Veitch & Sons, Exeter.
 Oracle, from Mr. T. Laxton, Bedford.
 Renown, from Mr. H. Eckford.
 Sequel, from Mr. H. Eckford.

FRUIT COMMITTEE, JULY 12, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and sixteen members present.

Awards Recommended:—*Silver Banksian Medal.*

To Her Majesty the Queen, The Royal Gardens, Frogmore (gardener, Mr. Thomas), for six large, handsome, and extremely well grown Smooth Cayenne Pine-apples, and six dishes of Cherries of great merit.

To Earl Cowper, Panshanger, Herts (gardener, Mr. Fitt), for 12 medium-sized but pretty fruits of The Queen Pine-apple, and a large bunch of Bananas, the Ladies' Fingers variety, which received a First-class Certificate last year.

Cultural Commendation.

To Lord Suffield, Gunton Park (gardener, Mr. Allan), for examples of his new Strawberries Lord Suffield and Empress of India, also a new seedling variety, all of which were very handsome and of excellent quality.

Other Exhibits.

The Duke of Northumberland, Syon House, Brentford (gardener, Mr. Wythes), exhibited a collection of 12 Melons.

Melons were also shown by Lord Shrewsbury, Ingestre (gardener, Mr. Gilman); Mr. C. J. Terry, Tatton Park; and Mr. Leach, of Albury Park Gardens.

From the Society's Gardens, Chiswick, came a dish of Trifer Fig, a very early variety, and a collection of the different varieties of Vegetable Marrows.

T. Donaldson, Esq., Chiswick (gardener, Mr. Bones), sent a new Cauliflower having the leaves glossy green and quite distinct. This was recommended to be tried in the Gardens.

Mr. A. Bird, Eynham Lodge, Shepherd's Bush, exhibited a Tomato which resembled the Blenheim Orange.

Messrs. Veitch & Sons, Chelsea, exhibited examples of Broad Bean somewhat smaller but of the same type as Beck's Gem.

M. Maudit, Caen, Calvados, France, exhibited examples of a new grafting wax to be used in a cold state.

Prizes.

Class 7.—Three dishes of Peas, twenty-four pods each of Sharpe's Sir F. A. Milbank, Sharpe's Queen, and Sharpe's Triumph. Open. *First Prize*, £2. 2s., to Mr. C. Osman, Sutton, Surrey. *Second Prize*, £1. 1s., to F. A. Pridden, Esq., Boxgrove, Guildford (gardener, Mr. T. Watkins). *Third Prize*, 10s. 6d., to Rev. L. R. Flood, Merrow Rectory, Guildford (gardener, Mr. J. Gilbert).

FRUIT COMMITTEE, AT CHISWICK, JULY 22, 1892.

J. WRIGHT, Esq., in the Chair, and five members present.

Awards Recommended :—

Highly Commended (× × ×).

To Pea John Lee, from Mr. T. Laxton, Bedford.

To Pea Matchless Marrow, from Messrs. Barr & Son, Covent Garden.

To Pea Veitch's Success, from Messrs. Barr & Son.

To Pea The Daniels, from Messrs. Barr & Son.

To Pea Triumph, from Messrs. Barr & Son.

To Pea Wem, from Mr. H. Eckford, Wem, Salop.

Commended (× ×).

To Pea Censor, from Mr. Eckford.

To Pea Shropshire Hero, from Messrs. Barr & Son.

Pea Heroine, an older variety, was again commended,

FRUIT COMMITTEE, JULY 26, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and twenty-two members present.

Awards Recommended :—*Silver Gilt Flora Medal.*

To Messrs. Rivers & Son, Sawbridgeworth, for a large and splendid collection of Cherries, Peaches, and Nectarines.

Silver Flora Medal.

To Messrs. J. Veitch & Sons, Chelsea, for a large collection of Gooseberries, comprising most of the leading varieties.

To Mr. Divers, Ketton Hall Gardens, Stamford, for a collection of Peaches.

Bronze Banksian Medal.

To Mr. Owen Thomas, The Royal Gardens, Frogmore, for a collection of Melons and Peaches.

First Class Certificate.

To Nectarine Early Rivers (votes, unanimous), from Messrs. Rivers & Son, Sawbridgeworth.

Award of Merit.

To Melon Emerald Gem (votes, 8 for, 7 against), from the Earl of Dysart, Ham House, Richmond (gardener, Mr. Sage). A very distinct green-fleshed variety.

To Tomato Royal Sovereign (votes, 10 for, 6 against), from Mr. Gilbert, Burghley Gardens, Stamford. A flesh-coloured fruit of fair quality.

Other Exhibits.

Mr. Miller, Ruxley Lodge, Esher, exhibited a dish of Grosse Mignonne Peaches and two Melons.

Mr. Wythes, Syon Gardens; R. Burnell, Esq., Bury St. Edmunds; and Mr. Fitt, Panshanger Gardens, exhibited new varieties of Melons.

Messrs. Hammond & Son, The Eden Vineyard, Carlisle, exhibited examples of a large and fine Black Currant, proposed to be named W. E. Gladstone.

W. A. South, Esq., Neasden, sent good dishes of Tomatos.

Messrs. Carter & Co. exhibited examples of a new Pea, Carter's Daisy.

FRUIT COMMITTEE, AUGUST 9, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and fourteen members present.

Awards Recommended:—

Silver Banksian Medal.

To Mr. T. Burton, Bexley Heath, for some large and fine examples of Peaches and Nectarines as grown for market.

First Class Certificate.

To Cherry Empereur François (votes, unanimous), from Messrs. T. Rivers & Son, Sawbridgeworth. A tender white-fleshed variety of remarkably fine quality.

To Plum Late Transparent Gage (votes, unanimous), from Messrs. T. Rivers & Son. A large clear-skinned variety of very fine quality.

To Fig Nebian (votes, unanimous), from the Society's Gardens, Chiswick. A very large deep green variety with deep red flesh.

To Fig Monaco Bianco (votes, unanimous), from the Society's Gardens. A green Fig, extremely rich in quality.

To Fig Bourjasotte Grise (votes, unanimous), from the Society's Gardens. A medium-sized, grizzly-skinned variety of remarkably fine quality.

To Fig Gourand Noir (votes, unanimous), from the Society's Gardens. A dark purple, ovate, medium-sized variety, very free fruiting.

To Fig Violette Sepor (votes, unanimous), from the Society's Gardens. Fruit medium size, deep green shaded violet, remarkably rich.

Cultural Commendation.

To Messrs. Johnson & Sons, Boston, for 13 varieties of Peas.

Other Exhibits.

From the Society's Gardens came a collection of 30 varieties of Figs in addition to the five varieties which were certificated, many of which were of great merit and excellence. Twelve varieties of Vegetable Marrows were also sent.

MESSRS. W. HENDER & SONS, PLYMOUTH, sent a dish of green Gooseberries.

The Duke of Northumberland, Syon House (gardener, Mr.

Wythes); T. Statler, Esq., Stand Hall, Manchester; Mr. J. Barkham, Longford Street, Ryde; and W. M. Bullivant, Esq., exhibited seedling Melons.

Messrs. Sutton & Sons, Reading, exhibited examples of three large and handsome varieties of Peas, which were requested to be sent to Chiswick for trial.

W. A. South, Esq., Neasden House, N.W., exhibited a dish of seedling Tomatos.

The Duke of Northumberland, Albury Park (gardener, Mr. Leach), exhibited a dish of Tomato Ladybird, a variety of fine form.

Messrs. Pearson & Sons, Chilwell, sent examples of a fine large Tomato named Swanson's Eclipse.

FRUIT COMMITTEE, AT CHISWICK, AUGUST 23, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and sixteen members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. H. Lane & Son, Berkhamstead, for fruiting branches of 30 varieties of Plums.

First Class Certificate.

To Fig Large Black Douro (votes, unanimous), from the Society's Gardens. A large, long fruit of a dark purple colour, moderate quality, very free fruiting.

To Tomato Collins' Challenger (votes, unanimous), from Messrs. Collins Bros. & Gabriel, 39 Waterloo Road. Fruit of medium size, deep red. Exceedingly pretty and free fruiting.

Cultural Commendation.

To W. Roupell, Esq., Roupell Park, for some well-ripened fruit of Diamant Traube Grape, a large clear-skinned variety of the Sweetwater section.

Other Exhibits.

W. Roupell, Esq., staged a basket of varieties of Frontignan Grapes, which were of excellent flavour, and also some fine Lady Sudeley Apples.

From the Society's Gardens were shown examples of two varieties of Hungarian Grapes—Volovna, of the Frontignan class, and Oreg Tardovany, a clear-skinned Sweetwater. Also seven varieties of very clear-skinned Apples, which had been grown in pots under glass. The examples of Lady Sudeley were remarkably beautiful and full of colour.

Mr. George Lee, Clevedon, exhibited a new seedling Apple somewhat resembling Red Astrachan.

Mr. John King, Bandon Hill, Croydon, sent a shoot of the Victoria Plum.

Mr. Leach, Albury Park Gardens, showed fruit of Damson Bradley's King.

From Syon House—the Duke of Northumberland's—came four dishes of Apricots.

Mr. Watkins, Pomona Farm, Hereford, staged a large collection of Plums.

Mr. J. Gibson, The Oaks Gardens, Carshalton, exhibited some fine large Onions and examples of Student Parsnip.

FRUIT COMMITTEE, AT CHISWICK, AUGUST 30, 1892.

J. WRIGHT, Esq., in the Chair, and three members present.

The Committee examined the Runner Beans, the collection numbering over seventy varieties. Several varieties were cooked and tasted.

Awards Recommended:—

Highly Commended (× × ×).

To Scarlet Runner Bean—

Fillbasket, from Messrs. J. Veitch & Sons, Chelsea (caseknife).

Flageolet Wax, from Herr Benary, Erfurt (butter bean).

Hill's Prize, from Messrs. Bunyard & Co., Maidstone (scarlet).

Hungarian Butter, from Messrs. Vilmorin, Paris (butter bean).

Jubilee, from Messrs. Carter & Co., Holborn (white-flowered).

Mont d'Or, from Messrs. J. Veitch & Sons, Chelsea (butter bean).

Sutton's Prizewinner, from Messrs. Barr & Son, Covent Garden (scarlet).

Tender and True, from Messrs. Sutton & Sons, Reading (French runner).

Commended (× ×).

To Scarlet Runner Bean—

Emperor Frederick, from Messrs. Vilmorin, Paris (French runner).

Giant White, from Messrs. J. Veitch & Sons, Chelsea (white runner).

Invincible, from Messrs. Sutton & Sons, Reading (French runner).

New Giant Titan, from Mr. Laxton, Bedford (white runner).

The Czar, from Herr Benary, Erfurt (white runner).

The Committee examined a Melon sent by Mr. J. Hudson, Gunnersbury House, Acton, and requested that a sample should be seen again, at Westminster.

FRUIT COMMITTEE, SEPTEMBER 6, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and twenty members present.

Awards Recommended:—

Silver Gilt Flora Medal.

To Messrs. Geo. Bunyard & Co., Maidstone, for a very large and fine collection of Apples, Pears, Plums, &c., contained in 75 dishes and 12 baskets, admirably arranged, the Apples being specially fine.

To Messrs. Veitch & Sons, Chelsea, for a collection of fruit—Apples, Pears, Plums, Figs, &c., of excellent quality.

Silver Banksian Medal.

To J. T. Hopwood, Esq., Ketton Hall (gardener, Mr. Divers), for a collection of large and fine Peaches and Nectarines. These were admirably grown.

To Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), for a collection of fruit, comprising examples of Peaches, Nectarines, Pears, Figs, Grapes, Melons, &c., in good condition.

First Class Certificate.

To Pea Veitch's Success (votes, unanimous), from the Duke of Northumberland, Syon House (gardener, Mr. Wythes). This variety had been grown at Chiswick. (*See* p. lxx.)

Cultural Commendation.

To J. Bucknall, Esq., Langley Court, Beckenham, for very fine Sea Eagle Peaches.

Other Exhibits.

Mr. W. Weir, Acton Park, Wrexham, sent a new seedling Grape raised from seed received from the Cape of Good Hope, and hence named The Cape Muscat. The bunch was large, as were also the ovate and quite black berries. The Committee requested it to be shown again.

Mr. W. Palmer, Conden Villas, Andover, sent two Melons raised from the Hero of Lockinge.

Mr. Bowerman, Hackwood Park Gardens, sent a dish of Apples named Owen's Seedling.

Messrs. Cheal & Sons, Crawley, exhibited shoots of several varieties of Crabs, which were very pretty.

Mrs. Cooper, Lewes Road, Brighton, sent a seedling Apple named Mrs. Cooper.

Harrison Weir, Esq., Sevenoaks, submitted examples of Apples so greatly altered in character by the process of grafting that they could not be recognised.

The Duke of Northumberland, Syon House (gardener, Mr. Wythes), sent a dish of Pond's Seedling Plum.

Major Thornhill, Stanton-in-the-Peak, Derbyshire, sent a new Pea, which it was requested should be tried at Chiswick.

Mr. R. Dean, Ealing, exhibited some fine clusters of Conference Tomato.

Mr. R. Owen, Maidenhead, sent fruit of Tomato ponderosa, a large dull red variety.

E. Burnand, Esq., Woodcock Road, Wallington, sent fruit of the Peach Tomato named Sabine's Choice.

From the Society's Gardens, Chiswick, there was exhibited a collection of 46 varieties of Runner Beans.

FRUIT COMMITTEE, AT CHISWICK, SEPTEMBER 13, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and fourteen members present.

Awards Recommended :—

Highly Commended (× × ×).

To Potato—

Reading Giant, from Mr. C. Fidler, Reading, Berks.

Laxton's Short-top, from Messrs. Laxton Bros., Bedford.

Mary Anderson, from Mr. H. Fletcher, Annesley, Notts.

The Canon, from Mr. R. Dean, Ranelagh Road, Ealing.

King of the Earlies, from Mr. H. Ridgewell, Cambridge.

Boston Q Q, from Messrs. W. W. Johnston & Sons, Boston, Lincoln.

Commended (× ×).

To Potato—

Crawley Prizetaker, from Messrs. J. Cheal & Sons, Crawley, Sussex.

White Round, from Messrs. Paul & Son, Cheshunt.

White Russet, from Mr. A. Harris, Wavendon, Bletchley, Bucks.

FRUIT COMMITTEE, SEPTEMBER 20, 1892.

PHILIP CROWLEY, Esq., F.L.S., in the Chair, and seventeen members present.

Awards Recommended :—

Silver Gilt Knightian Medal.

To Her Majesty the Queen, Frogmore (gardener, Mr. Owen Thomas), for a very large collection of well-grown fruit, viz.: Twelve Smooth Cayenne Pine-apples, weighing from 8 lbs. to 9 lbs. each, twelve Melons in variety, twelve varieties of Peaches and seven of Nectarines, nineteen varieties of Plums, seven of Apples and seven of Pears, five varieties of Grapes, including the Black Hamburgh from the two celebrated vines at Hampton Court and Cumberland Lodge, with Mulberries, Quinces, &c., the whole forming probably the most varied and meritorious display of fruit ever exhibited.

Silver Banksian Medal.

To Messrs. Rivers & Son, Sawbridgeworth, for splendid examples of Peaches Albatross, Sea Eagle, Princess of Wales, and others, with several varieties of Plums in very fine condition.

First Class Certificate.

To Hill's Prize Runner Bean (votes, 12 for), from Messrs. Bunyard & Co., a variety which had received × × × at Chiswick. (See page lxxiv.)

To Prizewinner Runner Bean (votes, unanimous), from Messrs. Sutton & Sons, a variety which had received × × × at Chiswick. (See page lxxiv.)

To Potato Reading Giant (votes, unanimous), from Mr. C. Fidler, Reading, Berks. (See page lxxvii.)

To Potato Laxton's Short-top (votes, unanimous), from Messrs. Laxton Bros., Bedford. (See page lxxvii.)

To Potato Mary Anderson (votes, unanimous), from Mr. H. Fletcher, Annesley, Notts. (See page lxxvii.)

To Potato The Canon (votes, unanimous), from Mr. R. Dean, Ranelagh Road, Ealing. (See page lxxvii.)

To Potato King of the Earlies (votes, unanimous), from Mr. H. Ridgewell, Cambridge. (See page lxxvii.)

To Potato Boston QQ (votes, unanimous), from Messrs. W. W. Johnston & Sons, Boston, Lincoln. (See page lxxvii.)

Award of Merit.

To Melon Bearwood Gem (votes, 15 for), from John Walter, Esq., Bearwood, Wokingham (gardener, Mr. Tegg). A very pretty variety, and of remarkably good quality.

To Tomato Blenheim Orange (votes, unanimous), from Messrs. Carter & Co. A large orange-yellow variety, and of good quality.

To Potato Crawley Prizetaker (votes, unanimous), from Messrs. J. Cheal & Sons, Crawley, Sussex. (See page lxxvii.)

To Potato White Round (votes, unanimous), from Messrs. Paul & Son, Cheshunt. (See page lxxvii.)

To Potato White Russet (votes, unanimous), from Mr. A. Harris, Wavendon, Bletchley, Bucks. (See page lxxvii.)

Cultural Commendation.

To Mr. S. T. Body, 99 Loughborough Road, for 10 varieties

of Apples grown in a London back garden within the three-mile radius.

To Messrs. Dobbie & Co., Rothesay, for examples of their new International Prize Leek along with the ordinary form ; also good examples of Carrots, Turnips, Parsley, &c.

Other Exhibits.

Mr. E. Molyneux, Swanmore Gardens, Bishop's Waltham, sent some very large and highly coloured fruit of Worcester Pearmain Apple.

Seedling Apples were shown by Messrs. John Laing & Sons, who staged Milner's Seedling, and by Messrs. Kimberley & Sons, Stoke, Coventry, who submitted Automne Rouge.

Mr. S. Mortimer, Swiss Nursery, Farnham, sent fruits of *Ribes sanguineum*.

H. St. Vincent Ames, Esq. (gardener, Mr. Bannister), Cote House, Westbury-on-Trym, sent some fine fruits of Doyenné Boussoch Pear.

F. Middleton, Esq. (gardener, Mr. E. Smith), Upperthorpe, Sheffield, sent examples of Tomato Upperthorpe Orange. A yellow Plum variety, and an enormous cropper.

Mr. C. Leach sent examples of Tomato Ladybird.

Mr. W. Shaw, Hextable, Kent, sent Tomato Mitchell's No. 1. A dark red variety of fine appearance.

From the Society's Gardens were exhibited 40 varieties of Potatos which had been grown in the Gardens during the present season.

FRUIT COMMITTEE, OCTOBER 4, 1892.

PHILIP CROWLEY, Esq., F.L.S., in the Chair, and nineteen members present.

Awards Recommended :—

Silver Gilt Knightian Medal.

To Messrs. J. Cheal & Sons, Crawley, for 130 dishes of Apples and Pears, many of which were remarkably fine and handsome.

Silver Knightian Medal.

To the Dowager Lady Freake, Fulwell Park, Twickenham

(gardener, Mr. Rickwood), for a collection of 40 dishes of Apples and Pears, remarkably well grown ; the specimens large and clear.

To A. Smee, Esq., The Grange, Carshalton (gardener, Mr. Cummins), for 60 dishes of Apples, which were much admired for their large size and fine appearance.

First Class Certificate.

To Apple Rivers' Codlin (votes, 10 for, 1 against), from Messrs. Rivers & Son. Fruits of large size, ovate shape. A very fine cooking fruit, and a very free bearer.

To Grape White Gros Colmar (votes, 6 for, 5 against), from the Society's Gardens, Chiswick. A seedling white Grape raised by Mr. Roberts, Charleville Forest, Ireland, and sent to the Gardens for trial. Fruit large, nearly round, of a pale yellow colour ; flesh firm, juicy, and very pleasantly flavoured.

Award of Merit.

To Grape Chasselas Vibert (votes, unanimous), from the Society's Gardens, Chiswick. A very early white Sweetwater Grape of pleasant quality ; berries round, clear-skinned.

To Apple King Harry (votes, unanimous), from the Society's Gardens. A medium-sized, conical fruit, of a pale orange colour, studded with russet ; flesh firm, juicy, and richly flavoured. A very nice dessert Apple, in season during October.

To Apple The Gem (votes, 9 for, 6 against), from Mr. Ross, gardener to Col. Archer Houblon, Welford Park, Newbury. Fruits of medium size and very pretty. Raised from the Golden Reinette ; season October.

To Maize Adam's Early (votes, 9 for), from Mr. Willard, Holly Lodge, Highgate.

Cultural Commendation.

To Messrs. de Rothschild, Gunnersbury House, Acton (gardener, Mr. J. Hudson), for Tomato Ham Green Favourite.

Other Exhibits.

Mr. A. J. Brown, School of Handicraft, Chertsey, sent a small collection of Apples and Pears from cordon trees planted in 1890.

Messrs. Spooner & Sons, nurserymen, Hounslow, sent two seedling Apples named The Baron and Richmond Seedling.

Mr. G. Edmonds, The Grange, Gillingham, sent a seedling Apple named Empress ; and Mr. James Miles, Normandy Farm, Erith, another named Duchess of Kent.

W. H. Evans, Esq., Forde Abbey, Chard (gardener, Mr. Crook), exhibited some fine Reine Claude de Bavay and Coe's Golden Drop Plums, with Sea Eagle Peaches.

Dr. Frankland, The Yews, Reigate Hill, sent a seedling Melon.

Tomatos were exhibited by Mr. J. Simpson, Dollis Hall, Kilburn ; Mr. R. Owen, The Nurseries, Maidenhead ; and Mr. Hudson, Gunnersbury—the latter to show how well they grew in a bed of ashes.

Mr. John Wilson, Glenlee Gardens, Hamilton, sent a large overgrown Cucumber, and Mr. Leach, Albury Park Gardens, some good Cos Lettuces named Autumn Queen, similar to the Bath Cos.

FRUIT COMMITTEE, OCTOBER 18, 1892.

PHILIP CROWLEY, Esq., F.L.S., in the Chair, and fifteen members present.

Awards Recommended :—

Silver Gilt Knightian Medal.

To Messrs. Mayfarth, 16 Mincing Lane, for Fruit Evaporator.

To Messrs. Veitch & Sons, Chelsea, for a collection of 200 varieties of Apples and Pears, many being of great merit.

Silver Knightian Medal.

To Messrs. Peed & Son, Roupell Park Nurseries, for 100 dishes of Apples and Pears.

To Messrs. Paul & Son, Cheshunt, for 100 varieties of Apples and Pears.

To Martin R. Smith, Esq., Hayes Common, Beckenham (gardener, Mr. Blick), for 12 dishes of very large and fine specimens of Pears which had been grown in pots.

To the Duke of Northumberland (gardener, Mr. Wythes), for 100 dishes and baskets of Apples and Pears in very excellent condition.

To Messrs. John Laing & Son, Forest Hill, for 60 dishes of well-grown Apples.

To Mr. S. Mortimer, The Nurseries, Farnham, for a collection of Apples and Grapes, well coloured.

Bronze Banksian Medal.

To J. W. Melles, Esq., Sewardstone Lodge, Chingford (gardener, Mr. Nicholson), for 20 dishes of Pears.

First Class Certificate.

To Melon Beauty of Syon (votes, unanimous), from Mr. Wythes. Fruit rather small; bright orange-yellow skin and scarlet flesh. Remarkably fine quality.

To Tomato Ladybird (votes, 10 for), from Mr. W. C. Leach, Albury Park. Fruits large, handsome, deep red.

Award of Merit.

To Apple Monstrous Incomparable (votes, unanimous), from Mr. H. Becker, Jersey. Very large, pale yellow fruits, greatly resembling Golden Noble.

Cultural Commendation.

To Mr. E. Molyneux, Swanmore Park, Bishop's Waltham, for beautiful examples of Warner's King, Mère de Ménage, and Cox's Orange Apples.

Other Exhibits.

Messrs. Cooper, Taber, & Co., Rivenhall, Essex, exhibited two miniature varieties of Melon—No. 1 named New American Golden Lemon, No. 2 American Golden Peach. These proved moderately pleasant to the taste, and were very interesting. Messrs. Cooper & Co. also submitted a short green Ridge Cucumber named The Japanese Pole Cucumber, and a box of Worcester Pearmain Apple, very highly coloured.

Mr. Becker sent several kinds of Apples—No. 2 Jersey Lily, No. 3 Admirable Jaune, and No. 4 Royal Jersey—which were not considered equal to other similar sorts in cultivation.

Seedling Apples were also exhibited by the following, viz.: Messrs. Dickson & Co., Edinburgh, who staged one named James Grieve, a pale yellow fruit; Mr. J. Bowerman, Hackwood Park; Mr. W. Longley, The Mall Nursery, Faversham; Mr. Taylor, Isleworth; Mr. Smith, Loddington; Mr. W. Bull, Ramsden; Mr. Robt. Morrow, Leominster.

Mr. Rivers exhibited a boxful of Guigne de Winkler Cherry, a very late fruiting variety of pleasant flavour, and examples of Purple Crab-apple, which were very pretty.

Mr. G. T. Body, Loughborough Park, S.W., sent seven varieties of Apples grown in a London back garden.

Dr. Hogg, F.L.S., exhibited Catawissa Raspberry, from Beechlands, Sussex, to show its value as an autumn fruit.

Mr. J. Willard, Holly Lodge, Highgate, sent examples of Seakale Beet, recommending it as a useful vegetable.

From the Society's Gardens, Chiswick, came examples of two Hungarian Grapes—Muscat of Hungary, a small-berried, highly flavoured white Muscat; and Oreg Tardovany, a medium-sized white Sweetwater of extraordinary juiciness.

Examples of several varieties of Apples and Plums dried by Mayfarth's Fruit Evaporator at Chiswick were also shown; also the dried produce cooked for use, as well as cooked fresh fruit. The Committee considered the dried examples quite equal to the fresh in quality, and recommended that a Silver Gilt Medal be awarded to Messrs. Mayfarth for their apparatus, with the expression of their great satisfaction at the results achieved.

Prizes.

Class 1.—Apples grown in the open. Four dishes of Dessert, six dishes of Cooking; six fruits to a dish. *First Prize*, Silver Banksian Medal and £1, to Mr. A. W. Porteous, gardener to Mr. Watt, Devonhurst, Chiswick. *Second Prize*, 15s., to Mr. Nicholson, gardener to J. W. Melles, Esq., Sewardstone Lodge, Chingford.

Class 2.—Pears grown in the open. Six dishes of Dessert; six fruits to a dish. *First Prize*, Silver Banksian Medal and £1, to Mr. Nicholson, gardener to J. W. Melles, Esq. *Second Prize*, 15s., to Mr. Wythes, Syon Gardens.

Class 3.—Six bunches of Grapes, not less than three varieties. *First Prize*, Silver Banksian Medal and £2, to Mr. J. Hudson, Gunnersbury House Gardens. *Second Prize*, £1. 10s., to Mr. Thomas Osman, The Gardens, Ottershaw Park, Chertsey.

Class 4.—Six bunches of Grapes, for flavour, not less than three varieties. *First Prize*, Silver Banksian Medal and £2, to Mr. Thomas Osman, Chertsey.

FRUIT COMMITTEE, NOVEMBER 1, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and fourteen members present.

Awards Recommended :—

Bronze Banksian Medal.

To Lord Wimborne, Canford Manor, Dorset (gardener, Mr. Crasp), for a well-grown collection of Apples.

First Class Certificate.

To Plum Rivers' Orange (votes, unanimous), from Messrs. T. R. Rivers & Son, Sawbridgeworth. Fruits of medium size, round, yellow; flesh yellow, and of good flavour for so late in the season.

Cultural Commendation.

To Mr. R. Milner, Penrice Castle Gardens, Swansea, for some very large and handsome Onions, Ailsa Craig.

Other Exhibits.

Mr. W. Iceton, Granard Nurseries, Putney, sent baskets of Grapes Alicante and Gros Colmar, well coloured.

Messrs. R. Veitch & Sons, Exeter, sent examples of Pears stated to be Marie Louise, in order to show the great alteration caused by double grafting. The Committee were of opinion that the Pears submitted more closely resembled Pitmaston Duchess, and requested Messrs. Veitch to send leaves.

Mr. Watkins, Pomona Farm, Hereford, sent Apples Pickering's Seedling, Devonshire Red, and Tom Putt.

Mr. J. J. Kidd, Chase Nursery, Lynn, sent a seedling Apple named Kidd's Triumph.

From the Society's Gardens came examples of Grapes Mrs. Pearson, Black Monukka, and Royal Ascot, several varieties of Turnips, and a large collection of Savoys, which had been grown for trial.

FRUIT COMMITTEE, NOVEMBER 15, 1892.

PHILIP CROWLEY, Esq., F.L.S., in the Chair, and eleven members present.

Awards Recommended :—*Bronze Banksian Medal.*

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. Wythes), for two dozen Melons.

Other Exhibits.

Messrs. R. Veitch & Sons, Exeter, again submitted examples of Pears similar to those sent to the previous meeting, which the Committee still considered to be Pitmaston Duchess.

Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), exhibited Melon Golden Ball, which was requested to be sent again earlier in the season, and Brown Turkey Figs.

The Chairman, P. Crowley, Esq., sent examples of Rivers' Prolific Plum, dried in a kitchen oven and stewed, which were very good.

Seedling Apples were exhibited by Sir C. Nicholson, Bart., Totteridge, Herts, and Mr. W. Cardo, High Street, Edgware; and the Rev. C. S. Lowndes, Little Comberton Rectory, Per-shore, sent a number of local varieties, which proved somewhat interesting.

Mr. R. Gilbert, Burghley, sent a box of very sound and excellent Tomatos named Gilbert's Satisfaction, said to be good for forcing. The Committee wished to see it again in March.

Mr. C. Fidler, Reading, exhibited very large examples of Fidler's Colossal Potato, raised by Mr. Brawn, Walsall, which the Secretary was requested to have cooked and to report to the next meeting.

FRUIT COMMITTEE, DECEMBER 13, 1892.

P. CROWLEY, Esq., F.L.S., in the Chair, and twenty-two members present.

Awards Recommended :—*First Class Certificate.*

To Potato Fidler's Colossal (votes, unanimous), raised and exhibited by Mr. G. Brawn, Walsall. Tubers very large and

handsome, long kidney shape, white-skinned, of good quality, and an enormous cropper.

Other Exhibits.

Messrs. Cooper, Taber & Co. sent examples of a fine-looking, rough-skinned Potato, which the Committee recommended should be tried at Chiswick next year.

Mr. R. H. Vertegans, Birmingham, sent fruit of the Per-simmon (*Diospyrus Kaki*), grown under glass.

Mr. Crook, The Gardens, Forde Abbey, Chard, sent fruits of a medium-sized Tomato.

Mr. Charles Turner, Slough, sent some fine quality fruit of Knight's Monarch Pear.

Mr. Hudson, The Gardens, Gunnersbury, sent fine examples of Golden Noble and Waltham Abbey Seedling Apples, to show their distinctive characters.

H. St. Vincent Ames, Esq., Cote House, Westbury-on-Trym (gardener, Mr. Bannister), sent examples of a large handsome Apple, which the Committee proposed should be seen when growing next year by Mr. Peter Veitch, Exeter, who was requested to report on it to the Committee.

A. Smee, Esq. (gardener, Mr. Cummins), again submitted examples of Apple Rembrough. A handsome fruit, resembling King of the Pippins. The Secretary was instructed to see the tree next year, and to report.

Seedling Apples were also shown by Mr. J. Toogood, Alwalton Hall, Peterborough; Dr. Edward Corkey, Frome; and Mr. H. C. Prinsep, Buxted Park, Uckfield, and a large number to be named.

From the Society's Gardens, Chiswick, were sent examples of the following ten varieties of dessert Apples suitable and recommended for Christmas use, viz.: American Mother, Cox's Orange Pippin, Blenheim Orange, Cogswell, Braddick's Nonpareil, Rosemary Russet, King of the Pippins, Dutch Mignonne, Wagener, and Baumann's Red Winter Reinette. Also a small bunch of the white Gros Colmar Grape, still fresh and in good condition, and of good quality.

From the Gardens were also submitted a collection of varieties of Beets, including the leaf Beets, of which a separate report will be published.

FLORAL COMMITTEE.

JANUARY 12, 1892.

W. MARSHALL, Esq., in the Chair, and thirteen members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. H. Cannell & Sons, Swanley, for a fine group of Chinese Primulas.

To His Grace the Duke of Northumberland, Albury Park, Surrey (gardener, Mr. W. C. Leach), for a very fine group of Lachenalias.

Award of Merit.

To Primula Pink Queen (votes, unanimous), from Messrs. H. Cannell & Sons. A variety of a delicate pink colour.

To Primula Peach Blossom (votes, unanimous), from Messrs. H. Cannell & Sons. Also of a delicate pink.

To Canna Alphonse Bouvier (votes, unanimous), from Messrs. Paul & Son, Cheshunt. A very fine winter-flowering variety.

Other Exhibits.

Messrs. J. Veitch & Sons, Chelsea, sent specimens of Begonia Winter Gem, and branches of Daphne Merzereon grandiflora, Hamamelis japonica Zuccariniana and H. arborea, the shoots of which were laden with blossoms, and had been cut from the open ground.

FLORAL COMMITTEE, FEBRUARY 9, 1892.

W. MARSHALL, Esq., in the Chair, and twenty-four members present.

Awards Recommended :—

Silver Gilt Banksian Medal.

To Messrs. J. Laing & Sons for a fine group of Stove and Greenhouse Plants mixed with Orchids.

Silver Banksian Medal.

To Messrs. Hugh Low & Co. for a group of New Holland plants, among which were *Corræas*, *Pimeleas*, *Boronias*, *Ericas*, &c.

To the Hon. P. C. Glyn, Rook's-nest, Godstone, Surrey, for a collection of *Camellias*, *Acacia dealbata*, and *Clivias* (cut blooms).

To Mr. T. Walker, Whitton, Hounslow, for a large and well-grown group of *Cyclamen*.

To Mr. J. May, Gordon Nursery, Twickenham, for the same.

To the St. George's Nursery Company, Ealing, also for *Cyclamen*.

First Class Certificate.

To *Bertolonia argyroneura* and B. Comte de Kerchove (votes, unanimous), from Mr. C. F. Bause, Norwood.

To *Elæis melanococca* (votes, 11 for), from Messrs. B. S. Williams & Son, Holloway, N. A graceful Palm.

Award of Merit.

To *Clivia* Mrs. P. C. Glyn (votes, 6 for, 5 against), from the Hon. P. C. Glyn.

To *Iris histrioides* (votes, 11 for, 4 against), from Messrs. J. Laing & Son.

To Lilac *Président Grévy* (votes, unanimous), from Messrs. Paul & Son, Cheshunt. A valuable variety for early forcing.

Other Exhibits.

Several interesting plants were sent from the Royal Gardens, Kew, among them being a bunch of the fruit of *Caryota Cummingii*, a Palm from the Philippine Islands; blooms of *Hæmanthus magnificus*, *Aloe supralævis*, *Greyia Sutherlandi* (fig. 18), and a fine flower of *Brownea Crawfordi*.

Mr. G. Wythes, gardener to the Duke of Northumberland, Syon House, Brentford, sent a basket of *Amaryllis* and *Narcissus*.

Mr. R. Owen, Maidenhead, sent some blooms of late-flowering *Chrysanthemums*.

Messrs. Cannell & Sons, Swanley, staged a small collection of Chinese *Primulas* of the same strain as those shown at the last meeting.

Messrs. J. Veitch & Sons, Chelsea, sent branches of *Prunus*

(Amygdalus) Davidiana and its variety alba. The shoots, cut from trees growing in the open air, were covered with bloom; as

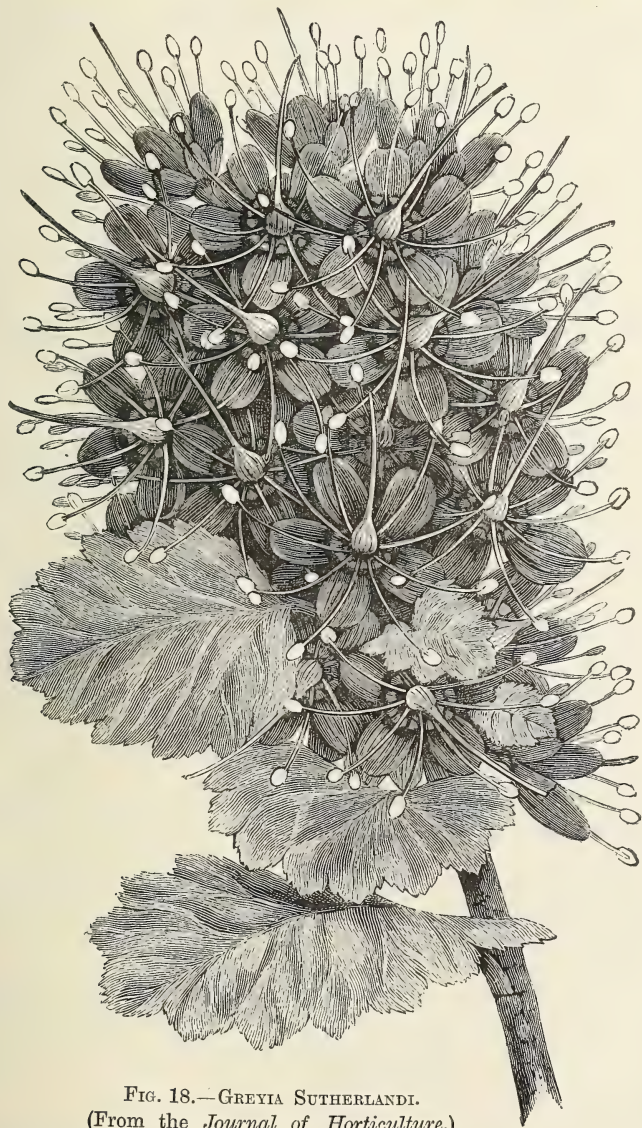


FIG. 18.—GREXIA SUTHERLANDI.
(From the *Journal of Horticulture*.)

were also sprays of *Lonicera Standishi*. Plants of *Lachenalia Aureliana* were also exhibited.

FLORAL COMMITTEE, MARCH 8, 1892.

W. MARSHALL, Esq., in the Chair, and twenty-four members present.

Awards Recommended:—*Silver Gilt Flora Medal.*

To Mr. G. Phippen, Reading, for a fine group of Hyacinths, Tulips, Lily-of-the-Valley, Scillas, &c.

Silver Gilt Banksian Medal.

To Messrs. W. Paul & Sons, Waltham Cross, for twelve boxes of cut Camellia blooms, noticeable amongst which were Princess Charlotte (white), Countess of Derby (pink), Reine des Fleurs (pink), and Fimbriata alba.

Silver Flora Medal.

To Messrs. Hugh Low & Co., Clapton, for a group of New Holland Plants, similar to those staged at the last meeting.

Silver Banksian Medal.

To Mr. T. S. Ware, Tottenham, for a group of Narcissi, including the following varieties: Emperor, Sir Watkin, and Golden Spur.

To Lord Wolverton, Iwerne Minster, Blandford (gardener, Mr. G. R. Davidson), for a group of Clivias with very fine trusses of bloom. The varieties noticeable were: Her Majesty, Duke of Clarence, Princess May, and Lord Wolverton.

First Class Certificate.

To Prunus (Amygdalus) Davidiana alba (votes, 18 for, 2 against), from Messrs. J. Veitch & Sons, Chelsea. Stated to have been cut from the open ground.

To Anthurium Andreanum sanguineum (votes, 13 for), from Sir Trevor Lawrence, Bart.

Award of Merit.

To Hippeastrum (Amaryllis) Mars (votes, 14 for, 2 against), from Messrs. Paul & Son, Cheshunt. A very fine variety, of a rich dark crimson colour.

Other Exhibits.

Sir Trevor Lawrence, Bart., Burford, Dorking (gardener, Mr. Bain), sent some remarkably fine Anthuriums, such as

A. Lindenii flore carmina, A. Lawrenceanum, A. leodiense, and A. burfordiense.

Messrs. J. Veitch & Sons, Chelsea, sent Hippeastrum (Amaryllis) Diores and H. Thalpius, of which the variety called Diores was the best. A box of Cineraria blooms was also sent.

Messrs. Cutbush & Sons, Highgate, sent specimens of Richardia æthiopica "Little Gem."

Messrs. P. Barr & Sons, Covent Garden, sent Iris alata alba.

Messrs. B. S. Williams & Son, Holloway, sent Dracæna Princess May, a narrow-leaved variety of a bronzy green and scarlet colour.

B. Field, Esq., Beechey Lees, Sevenoaks (gardener, Mr. Edwards), sent a spathe of Anthurium Andreanum giganteum.

The Rev. G. H. Engleheart, Appleshaw, Andover, sent blooms of an interesting hybrid Narcissus obtained from N. monophyllus and N. triandrus.

Mr. W. H. Evans, Forde Abbey, Chard, sent cut blooms of Begonia glaucophylla and Primula obconica purpurea.

FLORAL COMMITTEE, MARCH 22, 1892.

W. MARSHALL, Esq., in the Chair, and twenty members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Paul & Son, Cheshunt, for a group of Roses mixed with Azalea mollis and double Lilacs.

Silver Banksian Medal.

To Messrs. James & Son, Farnham Royal, for a group of Cinerarias.

To Messrs. Barr & Sons for a group of Narcissi.

To Messrs. Cutbush & Sons, Highgate, for a group of Foliage and Flowering Plants.

To Messrs. B. S. Williams & Son for a group of Clivias, Azaleas, Orchids, Hippeastrums, &c.

Bronze Banksian Medal.

To C. E. Smith, Esq., Silvermere, Cobham (gardener, Mr. Quarterman), for a group of forced Shrubs.

To His Grace the Duke of Northumberland (gardener, Mr. G. Wythes), for a miscellaneous group of Plants, principally forced ones.

First Class Certificate.

To *Ranunculus cortusæfolius* (votes, 10 for, 1 against), from Lord Hylton, Merstham House (gardener, Mr. C. Wood). Flowers bright shiny yellow, $1\frac{1}{2}$ inch across; a fine herbaceous plant. (*Bot. Mag.* t. 4625.)

Award of Merit.

To *Hippeastrum* (*Amaryllis*) *Eclipse* (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea. Creamy flowers streaked with red.

To *Euonymus japonicus compactus* (votes, 7 for, 6 against), from Messrs. B. S. Williams & Son, Upper Holloway, N. Leaves narrow, bright green with silver margins.

To *Hippeastrum* (*Amaryllis*) *Silver Queen* (votes, 9 for, 5 against), from Messrs. Paul & Son, Cheshunt. Flowers crimson with white markings.

To *Rose Caroline Testout* (votes, unanimous), from Messrs. Paul & Son, Cheshunt. A pretty pink hybrid.

To *Rose Danmark* (votes, 8 for, 4 against), from Messrs. W. Paul & Son, Waltham Cross.

Other Exhibits.

C. J. Lucas, Esq., Warnham Court, Horsham, exhibited some good seedling *Hippeastrums*.

From the Duke of Northumberland, Albury Park (gardener, Mr. W. C. Leach), came a very dark *Anthurium coccinea Leachii*.

A group of *Clivias* was contributed from the Society's Gardens at Chiswick.

FLORAL COMMITTEE, APRIL 12, 1892.

W. MARSHALL, Esq., in the Chair, and twenty-four members present.

Awards Recommended :—

Silver Gilt Flora Medal.

To Mr. W. Rumsey, Waltham Cross, for a group of Roses in pots, together with two boxes of cut Tea Roses.

Silver Flora Medal.

To Messrs. Hugh Low & Co., Clapton, for a group of New Holland plants in flower, consisting of *Ericas*, *Boronias*, *Polygalas*, *Aotus*, *Pimeleas*, &c.

Silver Banksian Medal.

To Messrs. Barr & Sons, Covent Garden, for a group of Daffodils.

To Sir Trevor Lawrence, Bart., Burford Lodge, Dorking (gardener, Mr. Bain), for a very fine collection of cut *Anthuriums*.

To Messrs. B. S. Williams & Son, Holloway, for a group of *Hippeastrums* and *Clivias*.

Bronze Banksian Medal.

To Messrs. Cutbush & Son, Highgate, for a group of Daffodils, *Ericas*, and Foliage Plants.

First Class Certificate.

To *Rhododendron campylocarpum* (votes, 15 for), from Messrs. Veitch & Son, Exeter. A species from the Sikkim Himalayas, with large lemon-yellow flowers. (*Bot. Mag.* t. 4968.)

To *Tecophilæa cyanocrocus* (votes, 16 for, 1 against), from Messrs. J. Laing & Sons, Forest Hill. A sweet-scented, blue-flowered bulbous plant, belonging to the order *Hæmodoraceæ*.

To *Utricularia Humboldtii* (votes, unanimous), from Baron Schröder, Egham. A species with large pale blue flowers.

To *Utricularia longifolia* (votes, 11 for), from Messrs. F. Sander & Co., St. Albans. A pretty species with pale mauve flowers.

Award of Merit.

To *Hippeastrum* (*Amaryllis*) *Crimson King* (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea. Flowers deep rich crimson.

To *Hippeastrum* (*Amaryllis*) *Firebrand* (votes, unanimous), from Messrs. Paul & Son, Cheshunt. A white-edged flower with scarlet markings.

Other Exhibits.

Messrs. Vilmorin, Paris, sent *Primula Forbesii*.

Messrs. Paul & Son exhibited *Canna Miss Sarah Hill*, which the Committee wished to see again.

Mr. C. Turner, Slough, sent a fine basket of *Niphetos* Roses.

Messrs. de Rothschild, Acton, showed flowers of *Magnolia conspicua*.

Mr. Fitt, Panshanger, Herts, sent flowers of the somewhat rarely flowered *Beaumontia grandiflora*. Flowers large and creamy white. (*Bot. Mag.* t. 3213.)

FLORAL COMMITTEE, APRIL 19, 1892.

W. MARSHALL, Esq., in the Chair, and twelve members present.

Awards Recommended:—

Silver Banksian Medal.

To the Guildford Hardy Plant Nursery for a group of Alpine Plants.

Bronze Banksian Medal.

To C. E. Smith, Esq., Silvermere, Cobham (gardener, Mr. Quarterman), for a group of Guelder Roses (cut flowers).

First Class Certificate.

To *Grevillea robusta elegantissima* (votes, 7 for), from Messrs. J. Veitch & Sons. A good table plant, with more slender foliage than the type.

To *Astilbe Thunbergii* (votes, unanimous), from Messrs. Jas. Veitch & Sons. A white-flowered species, in habit like *A. palmata*.

To *Rhododendron racemosum* (votes, 6 for), from Messrs. J. Veitch & Sons. A dwarf and hardy Chinese *Rhododendron*, with rosy-pink flowers.

Award of Merit.

To *Hippeastrum (Amaryllis) Sylvia* (votes, 6 for), from Messrs. J. Veitch & Sons. A hybrid from *H. reticulatum*.

To *Hippeastrum (Amaryllis) Charles Penny* (votes, unanimous), from the Viscountess Hambledon, Greenlands, Henley-on-Thames. Large crimson-scarlet flowers.

Other Exhibits.

Mr. W. H. Divers, Stamford, exhibited plants of double Violet Queen Victoria, Primrose Gilbert's Harbinger, and the old single white variety.

Mr. J. Chard, Brunswick Nursery, Stoke Newington, sent *Cyperus laxus variegatus*. A silvery variegated variety.

Messrs. Boelen Frères, Ledeberg-les-Gand, sent *Clivia Britannia*.

FLORAL COMMITTEE, MAY 3, 1892.

W. MARSHALL, Esq., in the Chair, and twenty members present.

Awards Recommended:—

Silver Flora Medal.

To Mr. H. B. May, Edmonton, for a group of Ferns.

Silver Banksian Medal.

To S. F. Still, Esq., Wimbledon (gardener, Mr. Curtis), for a group of *Hippeastrums* and *Auriculas*.

To Mr. R. Dean, Ealing, for a group of Primroses and *Polyanthuses*.

To Messrs. Barr & Son, Covent Garden, for a group of Daffodils.

To Messrs. Lane & Son, Berkhamstead, for a group of *Rosa polyantha* vars.

First Class Certificate.

To *Dracæna Coulingii* (votes, 10 for), from Messrs. B. S. Williams & Son, Upper Holloway, N.

To *Lotus peliorynchus* (votes, unanimous), from Sir Trevor Lawrence, Bart., Burford Lodge, Dorking (gardener, Mr. Bain).

To *Aglaonema costatum* (votes, 15 for), from Messrs. J. Veitch & Sons, Chelsea. An ornamental stove Aroid.

To *Caladium Souvenir de Paro* (votes, 6 for, 5 against), from Messrs. J. Veitch & Sons, Chelsea.

To *Tillandsia Moensii* (votes, 11 for), from Messrs. Veitch & Sons.

To *Tillandsia Massangeana superba* (votes, unanimous), from Messrs. Veitch & Sons. Leaves pale green marbled with brown.

Award of Merit.

To Tea Rose *Corinna* (votes, 11 for), from Messrs. Wm. Paul & Son, Waltham Cross. Flowers bright pink.

To Tea Rose *White Lady* (votes, 6 for, 3 against), from Messrs. Wm. Paul & Son. Flowers almost pure white.

To Rose Waban (votes, unanimous), from W. Furze, Esq., Teddington. Flowers of a deep pink colour.

To double Auricula Golden Drop (votes, 9 for, 4 against), from Mr. R. Dean, Ealing.

Other Exhibits.

S. F. Still, Esq., Wimbledon, sent examples of the curious *Arisæma fimbriatum*.

Mr. Barrett, Wellington, exhibited a box of seedling Auriculas.

Mr. H. B. May, Edmonton, showed Carnation Mrs. Hemsley, which the Committee wished to see again; also *Pteris moluccana*.

Mr. W. Rapley, Hillingdon Heath, showed a box of *Calceolaria* blooms.

Messrs. J. Veitch & Sons exhibited some of their new hybrid *Streptocarpus*.

Messrs. Laing & Sons, Forest Hill, showed *Lilium longiflorum*.

FLORAL COMMITTEE, MAY 17, 1892.

G. PAUL, Esq., in the Chair, and sixteen members present.

Awards Recommended :—

First Class Certificate.

To *Pandanus pacificus* (votes, unanimous), from Messrs. Veitch & Sons, Chelsea. A robust species with broad green leaves, suddenly contracted into an acuminate tail at the apex.

To *Wistaria sinensis alba* (votes, 11 for), from Messrs. J. Veitch & Sons' nursery, Coombe Wood.

Award of Merit.

To Hybrid Tea Rose Lady H. Grosvenor (votes, 9 for, 3 against), from Messrs. Wm. Paul & Son, Waltham Cross.

To *Pelargonium Arete* (votes, 5 for, 3 against), from Messrs. J. Veitch & Sons. A variety with large trusses of pink and white flowers.

Other Exhibits.

Messrs. J. Peed & Sons, Roupell Park, S.E., sent several fine varieties of *Anthurium*.

Messrs. Lane & Son, Berkhamstead, sent several plants of a pretty *Rosa polyantha* named The Pet, also a variety named Anna Marie de Montravel.

Mr. Jas. O'Brien, Harrow-on-the-Hill, exhibited flowers of *Cyrtanthus Tuckii*, and *C. angustifolius aurantiacus*, with bright orange-scarlet flowers.

Mr. H. Elliott, Christchurch, exhibited a pan of *Richardia albo-maculata nana*, the spathes being less than a foot high. The Committee requested to see the plant again.

The Hon. P. C. Glyn, Godstone (gardener. Mr. Friend), sent some good sprays of *Cantua dependens* and a box of the beautiful *Asystasia (Mackaya) bella*.

James Rogers, Esq., Chislehurst, exhibited a new seedling *Pelargonium*.

THE GREAT FLOWER SHOW

IN THE INNER TEMPLE GARDENS, LONDON,

WEDNESDAY AND THURSDAY, MAY 25 AND 26, 1892.

By the kind permission of the Treasurer and Masters of the Bench, the Society was enabled to hold for the fifth time a grand and magnificent show of flowers and fruit in the Inner Temple Gardens on the above dates.

The Exhibition was formally opened by the President of the Society, Sir Trevor Lawrence, Bart., accompanied by the Vice-Presidents and members of the Council, at one o'clock on the first day.

The weather was on the whole favourable, and the attendance of visitors was somewhat larger than in the previous year.

The band of Her Majesty's Royal Horse Guards (Blues), under the conductorship of Mr. Chas. Godfrey, was present each day, and performed selections of music.

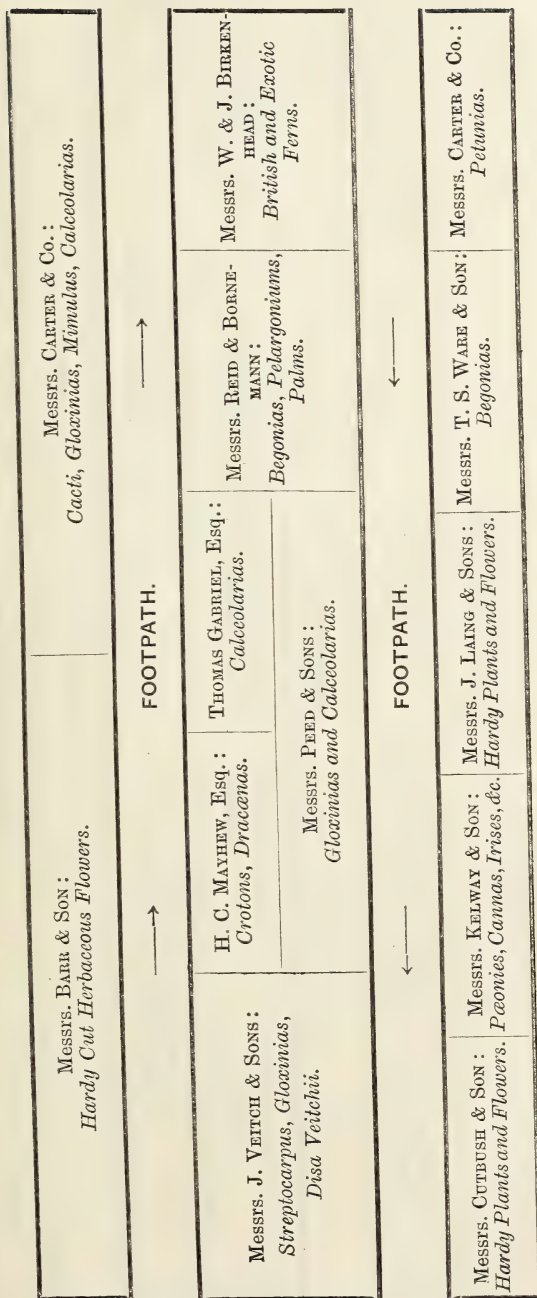
The display of Orchids, Roses, Ferns, Caladiums, Palms, Lilies, Cycads, Gloxinias, Calceolarias, Begonias, Pelargoniums, ornamental stove and greenhouse plants, hardy herbaceous plants, &c., was exceedingly grand; and two days were far from sufficient to examine in a satisfactory manner all the fine products of Flora and Pomona brought together on this occasion.

The various awards made by the Council will in themselves indicate the high estimation in which they regarded the groups of the various exhibitors; while new or noteworthy plants received recognition in the form of Certificates, &c., recommended by the Floral, Orchid, and Fruit Committees.

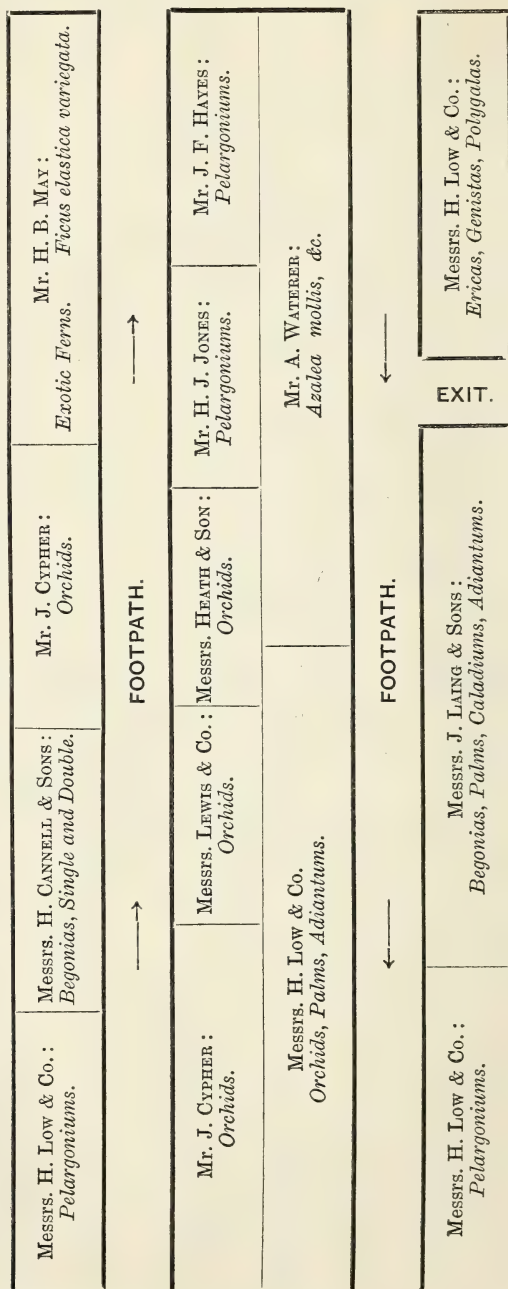
The accompanying plans of the four large tents will indicate the approximate position of almost every exhibitor, as well as the nature of the exhibits brought together on this occasion.

TEMPLE SHOW, 1892.—PLAN OF TENTS AND EXHIBITS.

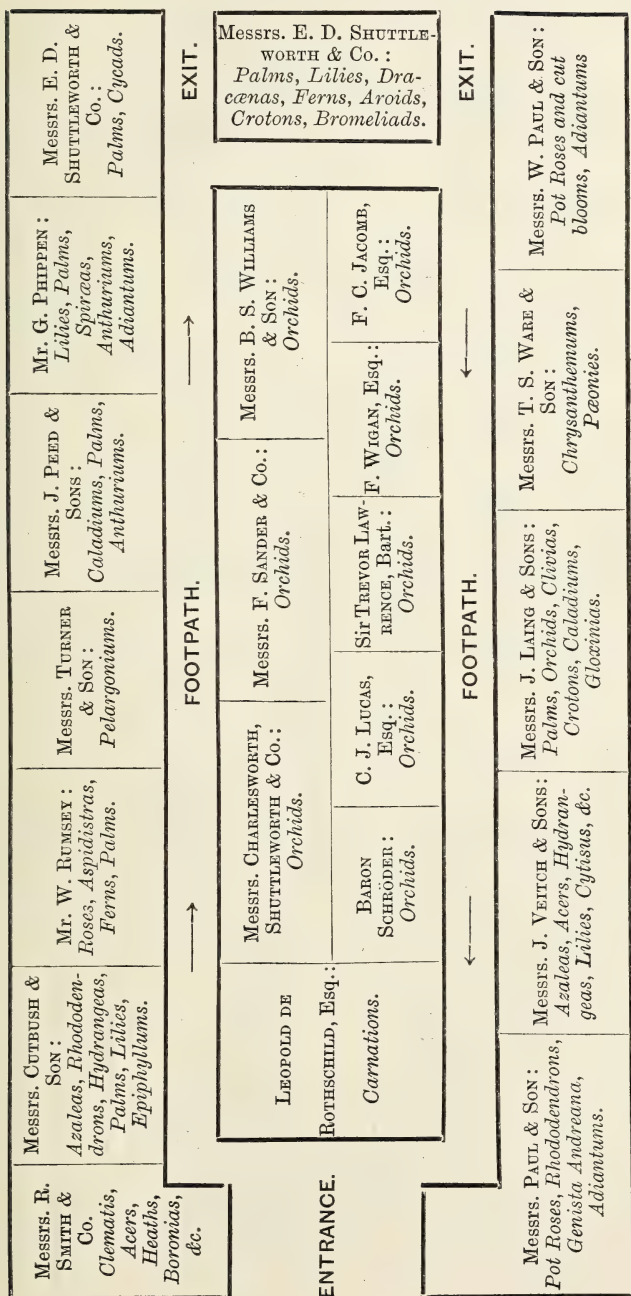
TENT No. 1.—PLAN.



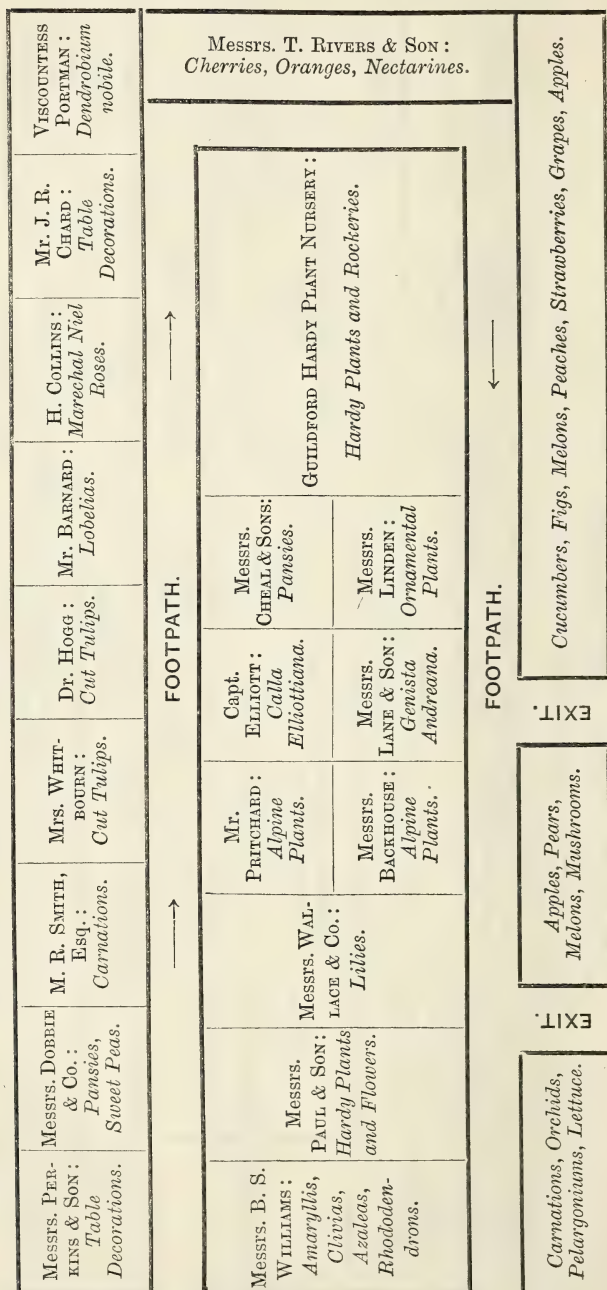
TENT NO. 2.—PLAN.



TENT NO. 3.—PLAN.



TENT NO. 4.—PLAN.



FLORAL COMMITTEE, MAY 25, 1892, IN THE TEMPLE GARDENS.

W. MARSHALL, Esq., in the Chair, and fifteen members present.

Awards Recommended:—

First Class Certificate.

To *Pteris tremula densa* (votes, 13 for), from R. Smith & Co., Worcester.

To *Dichorisandra musaica gigantea* (votes, 10 for); *Labisia smaragdina* (votes, 6 for); *Smilax argyrea* (votes, 11 for); *Stenandrium Lindenii* (votes, 11 for); *Tradescantia Regina* (votes, unanimous) and *T. superba* (votes, 11 for), from M. L. Linden, Parc Leopold, Brussels.

To *Azalea* Mrs. Anthony Waterer (votes, unanimous), from Mr. Anthony Waterer, Knap Hill, Woking.

To *Pteris serrulata gracilis* (votes, 10 for), from Mr. H. B. May, Edmonton.

To *Scolopendrium vulgare digitatum majus* (votes, 9 for) and *S. v. crispum fimbriatum* (votes, 8 for), from Mr. J. Birkenhead, Sale, Manchester.

To *Selaginella elegans* (votes, 9 for, 3 against), from Mr. H. B. May, Edmonton.

Award of Merit.

To *Begonia* Leopold Rothschild (votes, 11 for), from Messrs. H. Cannell & Sons, Swanley, Kent.

To *Begonia* Duchess of Westminster, Laing's var. (votes, unanimous), from Messrs. J. Laing & Sons, Forest Hill.

To *Begonia* Picotee (votes, 7 for, 6 against) and *Begonia* Laing's Triumph (votes 11 for), from Messrs. Jas. Laing & Sons.

To Tree *Pæony* Snowflake (votes, 12 for), from Mr. Thos S. Ware, Tottenham.

To Tree *Pæony* Orme (votes, 11 for), from Messrs. Kelway & Son, Langport.

To Tea Rose Princess May (votes, 13 for), from Messrs. Wm. Paul & Son, Waltham Cross.

To *Gloxinia* Clio (votes, 9 for) and *Gloxinia* Cicely (votes, 6 for), from Messrs. Veitch & Sons, Chelsea.

To *Carnation* Mrs. H. Cannell (votes 9 for, 6 against), from Messrs. H. Cannell & Sons, Swanley.

To *Dracæna Bartetti* (votes, 8 for), from Messrs. J. Laing & Sons.

To *Codiaeum (Croton) Reidii* (votes, 9 for), from Messrs. J. Laing & Sons.

To *Lobelia Barnard's Perpetual* (votes, 7 for, 3 against), from Mr. H. Barnard, Southgate.

To *Pelargonium Princess May* (votes, 12 for), from Messrs. J. & J. Hayes, Lower Edmonton.

To *Carnation Mrs. G. Devas* (votes, 14 for), from Martin Smith, Esq., Hayes Common.

Botanical Certificate.

To *Cyrtosperma ferox* (votes, 7 for), from Messrs. Linden, Brussels. An ornamental spiny Aroid.

Special Awards. (*See also pages lxxvi and clxix.*)

Silver Cup.

To Messrs. J. Laing & Sons for a large Mixed Group.

To Messrs. Jas. Veitch & Sons for a mixed group of Hardy Plants.

To Messrs. Wm. Paul & Son for a group of Roses.

To Mr. A. Waterer for a group of Azaleas.

To Messrs. Cutbush for a group of Mixed Plants.

To Mr. J. Birkenhead for a group of Ferns.

To Messrs. R. Smith & Co., Worcester, for a very fine group of Clematis.

Silver Gilt Flora Medal.

To Messrs. J. Carter for a collection of Gloxinias, Petunias, Calceolarias, Mimulus, and Pelargoniums.

To Messrs. B. S. Williams, Holloway, for a group of Azaleas, Amaryllis, and Clivias.

To Mr. H. B. May, Edmonton, for a group of Ferns and Foliage Plants.

To Messrs. Backhouse, York, for a collection of Alpine Plants.

To the Guildford Hardy Plant Co. for Alpine Plants.

To Messrs. Barr & Son, Covent Garden, for a group of Herbaceous Cut Flowers.

To Messrs. Kelway & Son, Langport, for a group of Cut Flowers, Pæonies, &c.

To Messrs. Laing & Sons for a group of Begonias.

To Messrs. Cannell & Son, Swanley, for a group of Begonias.

To Mr. Thos. S. Ware, Tottenham, for a group of Pæonies, &c.

To Messrs. G. Paul & Son, Cheshunt, for a group of Roses.

To Messrs. Chas. Turner, Slough, for a group of Pelargoniums.

To Messrs. James & Son, Farnham Royal, for Calceolarias and Pelargoniums.

To Messrs. Shuttleworth, Peckham Rye, for a group of Cycads, Palms, &c.

To Mr. Thos. S. Ware for a group of Begonias.

To Messrs. Perkins, Coventry, for an exhibit of Bouquets, &c.

To Mr. G. Phippen, Reading, for a group of Lily-of-the-Valley, Spiræas, and Palms.

To Messrs. J. Peed & Sons, Roupell Park, for a group of Anthuriums, Caladiums, &c.

To Mr. H. Jones, Lewisham, for a group of Pelargoniums.

Silver Flora Medal.

To Messrs. Paul & Son, Cheshunt, for Alpine and Hardy Cut Flowers.

To Messrs. J. Laing & Sons, Forest Hill, for a group of Hardy Cut Flowers.

To Messrs. Dobbie & Co., Rothesay, for a collection of Pansies, Violas, and Sweet Peas.

To Messrs. Shuttleworth for a group of Ferns and Foliage Plants.

To Messrs. Jas. Veitch & Sons, Chelsea, for Gloxinias and Streptocarpus.

To Leopold de Rothschild, Esq., for a group of Carnations.

To Messrs. Rumsey, Waltham Cross, for a group of Roses.

To Mr. J. Hayes, Lower Edmonton, for a group of Pelargoniums.

To Messrs. Low & Co., Clapton, for groups of Ericas and Pelargoniums.

To Messrs. J. Peed & Sons, Roupell Park, for a group of Gloxinias.

To Messrs. Wallace, Colchester, for a group of Liliums.

Silver Banksian Medal.

To H. Mayhew, Esq., South Norwood, for a group of Foliage Plants.

To Messrs. Reid & Bornemann, Sydenham, for a group of miscellaneous Flowering Plants.

To Mr. Pritchard, Christchurch, for Herbaceous and Alpine Plants.

To Messrs. Cutbush, Highgate, for Hardy Cut Flowers.

To Messrs. Chard & Son, Stoke Newington, for Table Decoration.

To Miss Hassell, Gravesend, for Table Decoration.

To Messrs. Peed & Sons, Roupell Park, for a group of Ferns and Foliage Plants.

To Captain Elliott, Farnborough Park, for a basket of the yellow *Calla Elliottiana*.

To T. S. Gabriel, Esq., Streatham, for a group of *Calceolarias*.

FLORAL COMMITTEE, JUNE 7, 1892.

W. MARSHALL, Esq., in the Chair, and fourteen members present.

Awards Recommended:—

Silver Gilt Flora Medal.

To Messrs. Kelway & Son, Langport, for a group of miscellaneous Hardy Herbaceous Cut Flowers.

Silver Flora Medal.

To Messrs. W. Paul & Son, Waltham Cross, for one dozen boxes of cut *Rhododendrons*, the flowers in great variety of colour and shape.

Silver Banksian Medal.

To Messrs. G. Paul & Son, Cheshunt, for a collection of Hardy Herbaceous Plants and Cut Flowers.

To Messrs. Dobbie & Co., Rothesay, for stands of Pansies, *Violas*, and Sweet Peas, forming a very bright exhibit.

First Class Certificate.

To *Dipladenia atropurpurea* (votes, unanimous), from Messrs. F. Sander & Co. A fine dark purplish-crimson flower; very free.

To *Ixora Westii* (votes, unanimous), from Messrs. de Rothschild, Gunnersbury House (gardener, Mr. J. Hudson). A charming light variety.

Award of Merit.

To double *Pyrethrum* Alfred Kelway (votes, 5 for, 3 against), from Messrs. Kelway & Son, Langport.

To single *Pyrethrum* Princess Marie (votes, 11 for), from Messrs. Kelway & Son, Langport.

To *Gloxinia* The Beacon (votes, 12 for) and *G. Ensign* (votes, 9 for), from J. Donaldson, Esq., Tower House, Chiswick (gardener, Mr. T. Bones).

To *Carnation* Yellow Queen (votes, 12 for), from J. Donaldson, Esq.

To *Gladiolus byzantinus albus* (votes, 7 for, 4 against), from the Rev. E. Arkwright, Seymour Street. A hardy white form of *G. byzantinus*. The flowers had been grown in the open air in Mr. Wilks's garden at Shirley.

Other Exhibits.

Mr. Frisby, Worden Hall Gardens, Preston, exhibited a basket of a very dwarf *Tagetes*, Little Gem.

Mrs. Robb, Chitley Farm, Liphook, brought *Solanum crispum* and *Cytisus scoparius* Moonlight, the latter being a creamy-yellow-flowered variety.

Messrs. de Rothschild, Gunnersbury House, Acton (gardener, Mr. J. Hudson), exhibited a fine stand of *Ixoras Westii* and *Fraseri* (cut blooms).

Mr. G. Yeld, Clifton, York, sent several hybrid *Iris*es and *Hemerocallis* Apricot.

Prizes.

Class 1.—Twelve Hardy *Rhododendrons*, three trusses each, distinct. Amateurs. *First Prize*, Silver Flora Medal and £1, to His Grace the Duke of Northumberland, Syon House (gardener, Mr. Wythes), *Second Prize*, 15s., to the Earl of Dysart, Ham House, Richmond (gardener, Mr. Sage).

Class 7.—Six Single and Six Double *Pyrethrums*, three blooms of each. Amateurs. *First Prize*, Kelway Silver Medal, to Lord Wimborne, Canford Manor (gardener, Mr. Crasp).

FLORAL COMMITTEE, AT CHISWICK, JUNE 14, 1892.

W. MARSHALL, Esq., in the Chair, and thirteen members present.

Awards Recommended :—

Highly Commended (× × ×).

To *Pæonia albiflora* varieties :

(The Committee are in no way responsible for the nomenclature, which seems to be greatly involved. A more complete report on the *Pæonies* will be published next year.)

P. albiflora, from Messrs. Dicksons, Chester (large creamy white).

P. Comte de Nanteuil, from Messrs. Dicksons (light rose, full centre.)

P. Comte de Paris, from Messrs. Dicksons (light rose, full centre).

P. Mme. Furtado, from Messrs. Dicksons (bright rose).

P. Mme. Vilmorin, from Messrs. Dicksons (large double rose).

P. Marie, from Messrs. Dicksons.

P. Queen Victoria, from Messrs. Dicksons (blush, white centre).

P. rubra triumphans, from Messrs. Dicksons (rich crimson, semi-double).

P. Belle Chatelaine, from Messrs. Paul & Son, Cheshunt (pale rose, creamy-white centre).

P. Caroline Allain, from Messrs. Paul & Son (blush, white centre).

P. Charles Binder, from Messrs. Paul & Son (pale rose, blush centre).

P. Duchesse de Nemours, from Messrs. Paul & Son (blush, creamy centre).

P. grandiflora nivea plena, from Messrs. Paul & Son (large double, creamy white).

P. La Voluptueuse, from Messrs. Paul & Son (deep purplish rose).

P. Modeste, from Messrs. Paul & Son (deep rose).

P. Nœmi Demay, from Messrs. Paul & Son (large double white).

P. Paul de Ritert, from Messrs. Paul & Son (crimson).

P. carnea elegans, from Messrs. Paul & Son (very large, pale rosy tint).

P. Mme. Calot, from Mr. T. S. Ware, Tottenham (blush).

P. Mme. Mechin, from Mr. T. S. Ware (deep crimson).

P. nivea plenissima, from Mr. T. S. Ware (white).

P. Augustin d'Hour (syn. *Camille Lemoine*), from M. V. Lemoine, Nancy, France (blush, crimson-rose centre).

P. Mme. de Montigo, from M. V. Lemoine (blush, creamy-white centre).

P. formosa alba, from M. Louis van Houtte, Ghent (creamy white).

P. Mme. Ducl, from M. Louis van Houtte (rose).

P. Algare Adanson, from M. Verdier, rose (blush centre.)

P. Canari, from M. Verdier (yellowish white).

P. Edouard André, from M. Verdier (rich crimson).

P. flavescens, from M. Verdier (white, yellow centre).

P. grandiflora lutescens, from M. Verdier (creamy white yellow centre).

P. lilacina plenissima, from M. Verdier (pale rose).

P. Lutetiana, from M. Verdier (purplish rose).

P. Princess Galatzin, from M. Verdier (blush, yellowish centre).

P. prolifera tricolor, from M. Verdier (blush, yellow and crimson centre).

P. Rubens, from M. Verdier (crimson).

P. sulphurea, from M. Verdier (large creamy white).

P. albiflora, var. *Whitleyi* (the Old Yellow), from the Society's Gardens (large white).

P. delicatissima, from Messrs. Barr & Son, Covent Garden (large pale rose).

Commended (× ×).

To *Pæonia* :

P. Abel de Pujol, from Messrs. Dicksons, Chester (purplish rose).

P. lilacea grandiflora, from Messrs. Dicksons (rose).

P. Louis Parmentier, from Messrs. Dicksons (pale rose).

P. Miranda, from Messrs. Dicksons (pale rose).

P. Princesse Mathilde, from Messrs. Dicksons (rose).

P. purpurea Delache, from Messrs. Dicksons.

P. Rose Randatler, from Messrs. Dicksons.

P. Victoria Modeste, from Messrs. Dicksons (rose shaded salmon).

P. violacea, from Messrs. Dicksons (crimson-rose).

P. Boule d'Or, from Messrs. Paul & Son, Cheshunt (white, centre petals edged crimson).

P. Gloire de Douai, from Messrs. Paul & Son.

P. Lucrèce, from Messrs. Paul & Son (white).

P. Mme. Boucharlet, from Messrs. Paul & Son.

P. Sidonie, from Messrs. Paul & Son (rose).

P. Virginie, from Messrs. Paul & Son (pale rose).

P. anemonæflora alba, from M. Verdier (creamy white, yellow centre).

P. Comtesse de Bresson, from M. Verdier (large rose).

P. Delecour Verhille, from M. Verdier.

P. Mme. Jules Calot, from M. Verdier (rose).

P. Mlle. Marie Jacquin, from M. Verdier (semi-double, yellow eye).

FLORAL COMMITTEE, JUNE 21, 1892.

W. MARSHALL, Esq., in the Chair, and twenty members present.

Awards Recommended:—

Silver Gilt Flora Medal.

To Lord Wimborne, Canford Manor, (gardener, Mr. T. Crasp), for a very fine group of Souvenir de la Malmaison Carnations.

Silver Flora Medal.

To Messrs. John Laing & Sons for a group of foliage and flowering plants, including Palms, Dracænas, Begonias, Orchids, &c.

To Messrs. Paul & Son, Cheshunt, for a large group of cut Herbaceous Flowers.

To Lord Penzance, Easting Park, Godalming (gardener, Mr. Baskett), for an interesting collection of seedling Sweet Briars (cut flowers).

Silver Banksian Medal.

To Messrs. Barr & Son, Covent Garden, for a large exhibit of cut Hardy Herbaceous and Bulbous Flowers.

To Messrs. Kelway & Son, Langport, for a group of Delphiniums, Pæonies, Pyrethrums, &c. (cut flowers).

To Messrs. J. Veitch & Sons, Chelsea, for a collection of Herbaceous Cut Flowers.

To Mr. H. Jones, Ryecroft Nursery, Lewisham, for a group of Pelargoniums.

First Class Certificate.

To Cornus Kousa (votes, 12 for), from Messrs. J. Veitch & Sons, Chelsea. A Japanese flowering Dogwood, with flowers (bracts) somewhat like a Trillium.

To Kniphofia (Tritoma) caulescens (votes, 12 for), from Messrs. J. Veitch & Sons, Chelsea.

To Calla Pentlandii (votes, unanimous), from R. Whyte, Esq., Pentland House, Lee. A large and fine yellow-spathed variety.

To Crinum brachynema (votes, unanimous), from Mr. J. Smith, Mentmore.

Award of Merit.

To Show Pelargonium Fireball (votes, 7 for) and P. Souvenir (votes, 6 for, 3 against), from Mr. Charles Turner, Slough.

To Decorative Pelargonium Rosy Gem (votes, 9 for), from Mr. Charles Turner, Slough.

To Carnation George Fry (votes, unanimous), from Messrs. John Laing & Sons, Forest Hill.

To double Pæonies Grizzel Muir (votes, 6 for, 2 against) and Lottie Collins (votes, 6 for, 3 against), from Messrs. Kelway & Son, Langport.

To Ivy Pelargonium Ryecroft Surprise (votes, 14 for), from Mr. H. Jones, Ryecroft Nursery, Lewisham.

To Pæony Snowball (votes, 9 for) and P. Mme. Breon (votes, 8 for), from Messrs. Barr & Son, Covent Garden.

To Tree Carnation Mrs. A. Helmsley (votes, 17 for), from Mr. H. B. May, Edmonton.

To Pæony Van Dyck (votes, unanimous), P. Mlle. Rosseau (votes, 6 for, 2 against), P. Mme. Loise (votes, 8 for), and P. Felix Crousse (votes, 9 for), from Messrs. Paul & Son, Cheshunt.

To Hybrid Tea Rose Gustave Regis (votes, 9 for), from Messrs. Paul & Son, Cheshunt.

To Caladium Marguerite Gelinier (votes, 13 for) and C. Mme. Ed. Pynaert (votes, 15 for), from Mr. Bause, Norwood.

To Sweet Briars Lucy Bertram (votes, unanimous) and Alice Bridgenorth (votes, unanimous), from Lord Penzance, Godalming.

To *Adiantum macrophyllum albo-striatum* (votes, 13 for, 2 against), from Messrs. H. G. Rogers, Lodsworth, Petworth. A form of *A. macrophyllum*, with greenish-white streaks on the fronds.

Other Exhibits.

Mr. R. Dean exhibited ten varieties of Pinks for certificates, but the Committee preferred to examine the plants at Chiswick before making an award, as they also did in the case of *Violas* shown by Messrs. Dobbie & Co., Rothesay.

W. H. Evans, Esq., Forde Abbey, Dorset, showed some good sprays of *Begonia glaucophylla*.

Mr. Smith, Market Drayton, Salop, sent a new yellowish *Coleus* named Shavington Seedling.

Messrs. de Rothschild, Gunnersbury Park, Acton (gardener, Mr. G. Reynolds), sent a box of *Streptocarpus* seedlings.

Mr. B. Ladhams, Shirley, Southampton, sent several bunches of seedling Pinks.

Mr. F. Ross, Bletchingley, exhibited a flowering plant of the somewhat rare and curious *Ismene Amancæa* (*Pact. Mag.* iii. 267; *Flore des Serres*, v. 449).

Messrs. J. Cheal & Sons, Crawley, Sussex, staged several fine varieties of *Violas*.

Prizes.

Class 1.—Collection of Herbaceous *Pæonies*, grown in the open. Not more than three blooms of a sort. Amateurs. *First Prize*, Silver Gilt Flora Medal and £1. 10s., to H. Berkeley James, Esq., Carshalton, Surrey (gardener, Mr. Gibson). *Second Prize*, £1, to Lord Wimborne, Canford Manor (gardener, Mr. Crasp).

FLORAL COMMITTEE, JULY 12, 1892.

W. MARSHALL, Esq., in the Chair, and sixteen members present.

Awards Recommended:—

Silver Gilt Flora Medal.

To MESSRS. Kelway & Son, Langport, for a large exhibit of cut flowers: *Delphiniums*, *Gaillardias*, and mixed herbaceous flowers.

Silver Gilt Banksian Medal.

To Mr. H. B. May, Dyson's Lane, Edmonton, for a group of Foliage Plants, tinted and variegated Ferns.

Silver Banksian Medal.

To Mr. Thos. S. Ware, Tottenham, for a group of Hardy Herbaceous Cut Flowers.

To Messrs. Jas. Veitch & Sons, Chelsea, for a collection of cut Hardy Flowering Shrubs, among which *Ligustrum sinense floribundum* was conspicuous.

Bronze Banksian Medal.

To Messrs. H. Cannell & Sons for a stand of bright-coloured Verbenas.

First Class Certificate.

To *Linaria Peloria* (votes, unanimous), from W. Marshall, Esq., Auchinraith, Bexley. A curious peloriate form of the Common Toad-flax (fig. 19).

Award of Merit.

To *Lilium Bloomerianum magnificum* (votes, 11 for), from Mr. Thos. S. Ware, Tottenham.

To *Gaillardia* Mr. Pitcher (votes, 10 for), from Messrs. Kelway & Son, Langport. Bright brown with a gold edge.

To *Delphinium* Sailor Prince (votes, 9 for), from Messrs. Kelway & Son, with fine deep blue flowers.

To *Delphinium* Princess May (votes, unanimous), from Messrs. Kelway & Sons. Very pale blue.

To *Delphinium* Henry Kelway (votes, 8 for), from Messrs. Kelway & Son. Semi-double, deep blue.

To *Campanula persicifolia semi-plena* (votes, unanimous), from W. Marshall, Esq., Bexley. Flowers semi-double, dark blue.

To *H.P. Rose* Clio (votes, 9 for), from Messrs. Wm. Paul & Son, Waltham Cross. A pretty blush pink; good size.

To double *Petunia* Schwester Bonifatia (votes, 9 for), from Messrs. H. Cannell & Sons, Swanley. A fringed variety, shaded pink and magenta.

Botanical Certificate.

To *Lilium maritimum* (votes, 11 for), from Mr. Thos. S. Ware, Tottenham.

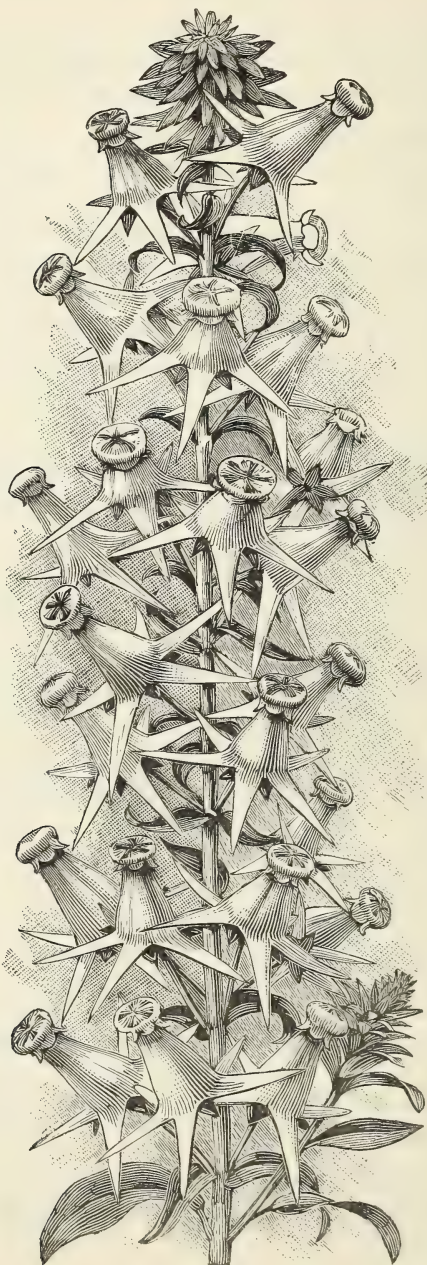


FIG. 19.—*LINARIA PELORIA*.
(From the *Journal of Horticulture*)

Other Exhibits.

From the Royal Gardens, Kew, was sent a large collection of cut Roses, species and garden varieties, showing the diversity of shape and colour in the various species.

Mr. C. W. Cousins, Wood Green, sent a group of eight dozen bunches of *Gladiolus Colvillei alba*.

Mr. C. Noble, Bagshot, showed a large spike of *Lilium giganteum* with thirteen flowers.

Messrs. Laxton Bros., Bedford, exhibited several bunches of Sweet Peas.

Messrs. J. Veitch & Sons sent trusses of hybrid Rhododendrons.

Prizes.

Class 1.—Eighteen Hardy Herbaceous Perennials. Bulbs admissible. Amateurs. *First Prize*, Silver Gilt Flora Medal and £2, to the Earl of Dysart, Ham House, Richmond (gardener, Mr. G. Sage).

Class 2.—Twelve bunches of Hardy Herbaceous Perennials. Amateurs. *First Prize*, Silver Flora Medal and £1. 10s., to H. Berkeley James, Esq., Carshalton. *Second Prize*, £1, to W. Marshall, Esq., Auchinraith, Bexley.

Class 3.—Eight bunches of Hardy Herbaceous Perennials. Amateurs. *First Prize*, Bronze Flora Medal and £1, to Miss Debenham, St. Peter's, St. Albans.

Mantell Silver Challenge Cup Competition for twenty-four Roses, three flowers of each. *First*, Mr. Benj. Cant, Colchester. *Second*, Mr. Frank Cant, Braiswick, Colchester. *Third*, Messrs. Paul & Son, Cheshunt.

FLORAL COMMITTEE, AT CHISWICK, JULY 22, 1892.

W. MARSHALL, Esq., in the Chair, and eight members present.

Awards Recommended:—

First Class Certificate.

To Foliage Begonia Crimson Gem (votes, unanimous), from Messrs. Sutton & Sons, Reading. (*See* page cxxiv.)

To Aster diplostefioides (votes, unanimous), from the Society's Gardens (fig. 20, p. cxviii).

Highly Commended ($\times \times \times$).

To Phlox decussata varieties :

P. Henri Murger, from M. V. Lemoine, Nancy, France, and Messrs. Dicksons, Chester.

P. Le Soleil, from Mr. Forbes, Hawick, N.B.

P. Epopie, from Messrs. Dicksons, Chester.

To Sweet Pea Her Majesty, from Mr. H. Eckford, Wem, Salop.

To Viola Duchess of Sutherland, from Messrs. Dobbie & Co., Rothesay, N.B.

To Begonia Mme. Louis Urban, from MM. Vilmorin, Paris.

FLORAL COMMITTEE, JULY 26, 1892.

W. MARSHALL, Esq., in the Chair, and sixteen members present.

Awards Recommended :—

Silver Gilt Flora Medal.

To Messrs. Paul & Son, Cheshunt, for a group of Herbaceous Flowers, Roses, and Carnations.

To Messrs. Pitcher & Manda, Hextable, for a large collection of insectivorous plants, such as Sarracénias, Droseras, Dionæas, &c.

To Messrs. Jas. Veitch & Sons, Chelsea, for a collection of Carnations, and Nepenthes, including N. Curtisii superba and N. Burkei excellens.

Silver Gilt Banksian Medal.

To Messrs. J. Laing & Sons, Forest Hill, for a group of Caladiums, &c.

To Martin R. Smith, Esq., Hayes Common, Beckenham, for a group of Carnations, which were well grown and in good variety.

Silver Banksian Medal.

To Messrs. Pitcher & Manda for a group of cut Herbaceous Flowers.

Bronze Banksian Medal.

To Messrs. Cannell & Sons, Swanley, for a collection of double Begonias (cut blooms).

First Class Certificate.

To *Nemesia strumosa Suttonii* (votes, unanimous), from Messrs. Sutton & Sons, Reading. A new half-hardy annual, with flowers of various shades of orange-scarlet.

To *Aster (Heterochaeta) diplostephioides* (votes, unanimous), from W. Marshall, Esq., Bexley. A large bluish-purple flower, with deep purple centre, surrounded by a ring of yellow anthers. A very pretty plant, but as yet somewhat doubtfully hardy (fig. 20).

Award of Merit.

To *Carnation Aline Newman* (votes, unanimous), from Martin R. Smith, Esq., Beckenham. A dull scarlet self.

To *Carnation Miss Constance Graham* (votes, unanimous), from Martin R. Smith, Esq. A scarlet flake.

To *Carnation Marnie Murray* (votes, unanimous), from Martin R. Smith, Esq. A scarlet self.

To *Carnation Horace Skimpole* (votes, unanimous), from Martin R. Smith, Esq. A salmon self.

To *Carnation The Pasha* (votes, unanimous), from Martin R. Smith, Esq. A large salmon-pink variety.

To *Carnation Oriflamme* (votes, unanimous), from Mr. Jas. Douglas, Ilford. A scarlet self.

To *Carnation Lady Wantage* (votes, unanimous), from Mr. Badcock.

To double *Begonia Baronne de St. Didier* (votes, 10 for), from Mr. Thos. S. Ware, Tottenham. A fine yellow.

To double *Begonia Princess May* (votes, 10 for), from Mr. Thos. S. Ware. A white variety.

To *Sweet Pea Lady Beaconsfield* (votes 5 for, 4 against), from Mr. Eckford, Wem, Salop. A pale pink variety.

To *Gloxinia Her Majesty* (votes, 10 for), from Messrs. Sutton & Sons. Good habit, white flowers.

To *Bedding Begonia Meteor*, from Messrs. Sutton & Sons. Flowers dull orange; leaves mottled with dark and light green.

To *Crococoma aurea* var. *imperialis* (votes, 5 for, 2 against), from W. Marshall, Esq., Bexley. Flowers orange-yellow; petals wider than in the type.



FIG. 20.—ASTER (HETEROCHETA) DIPLOSTEPHIOIDES.
(From the *Journal of Horticulture*.)

Other Exhibits.

J. Mackrell, Esq., Clapham Common, sent several bunches of Shirley Poppies.

W. South, Esq., Neasden, N.W. (gardener, Mr. Payne), sent a flowering specimen of *Dasyllirion acrotrichum* (*Bot. Mag.* t. 5030).

Mr. J. Riding, Chingford, exhibited a tray of Gloxinias.

Messrs. Veitch & Sons exhibited two baskets of well-flowered plants of *Lilium auratum* var. *rubro-vittatum*.

Messrs. H. Low & Co., Clapton, sent a plant of a new *Alocasia Edwardii*, a native of the Philippine Islands. The Committee wished to see the plant again.

Messrs. Clibran & Son, Altrincham, sent flowers of *Eucharis Clibranii*, a remarkable hybrid obtained by crossing the white *E. grandiflora* (amazonica) with the pollen of the orange-scarlet *Urceolina pendula aurea*. The flowers were intermediate between the parents, and were pure white and tubular. The Committee requested that plants might be shown when next in bloom.

M. L. Endtz, Boskoop, Holland, sent a variegated form of *Clivia robusta*.

Mr. Thos. S. Ware, Tottenham, exhibited several boxes of single and double Begonias.

Messrs. B. S. Williams & Son, Upper Holloway, sent a small and interesting group of Insectivorous Plants.

FLORAL COMMITTEE, AT CHISWICK, AUGUST 2, 1892.

W. MARSHALL, Esq., in the Chair, and four members present.

Awards Recommended :—

Highly Commended (× × ×).

To *Phlox decussata* varieties :

P. Flambeau, from M. V. Lemoine, Nancy, France, and Messrs. Dicksons, Chester (fiery red, dark eye).

P. Molière, from M. V. Lemoine (rosy pink, shaded rose).

P. Alexander Matheson, from Messrs. Dicksons, Chester (pale rose, dark eye).

P. Eugène Danzanvilliers, from Mr. Forbes, Hawick, N.B. (shaded lilac, centre white).

To Pentstemon W. M. Baillie, from Mr. Forbes, Hawick, N.B.

To Viola Queen of Scots, from Messrs. Dobbie & Co., Rothesay, N.B.

To Viola Duchess of Fife, from Messrs. Dobbie & Co.

Commended (× ×).

To Phlox decussata varieties :

P. Aspasia, from M. V. Lemoine (shaded lilac, white centre).

P. Roi de Roses, from Mr. Forbes.

P. Hironnelle, from Mr. Forbes.

P. Pureté, from Mr. Forbes (pure white).

P. John Forbes, from Mr. Forbes.

To Phlox suffruticosa varieties :

P. Miss Mima, from Mr. Forbes (white, pale pink eye).

P. Miss Cook, from Mr. Forbes (white, lilac eye).

FLORAL COMMITTEE, AUGUST 9, 1892.

W. MARSHALL, Esq., in the Chair, and seventeen members present.

Awards Recommended :—

Silver Banksian Medal.

To the Duke of Northumberland (gardener, Mr. G. Wythes), for a group of well-grown Campanulas (pyramidalis and turbinata varieties), which were much admired.

To Mr. Thos. S. Ware, Tottenham, for a group of Carnations (cut flowers), consisting of over thirty bunches of various colours.

To Messrs. Jas. Veitch & Sons, Chelsea, for a group of Hardy Flowering Trees and Shrubs, including Pavia macrostachya, with long erect spikes of greenish-white flowers and very long stamens ; and Eucryphia pinnatifolia, an extremely pretty flower, like an Hypericum, but with white petals.

To Messrs. Cannell & Sons for a group of Begonias (cut flowers), arranged with Asparagus foliage to form ladies' sprays, the whole being set in a groundwork of bracken.

First Class Certificate.

To Sarracenia Farnhami × (votes, 9 for), a pretty hybrid raised by W. E. Farnham, Esq., Loughborough.

Award of Merit.

To Carnation J. D. Pawle (votes, 8 for, 6 against), from A. Spurling, Esq., Blackheath. A fine yellow variety, with good habit.

To Dahlia Mrs. Keith (votes, 9 for, 4 against), from Messrs. Cannell & Sons, Swanley. A decorative variety, with rose petals and glowing yellow centre.

To Antirrhinum George Findlay (votes, 8 for, 3 against), from Mr. R. Dean, Ealing. A fine yellow variety, with orange-scarlet streaks and spots.

To Carnation King of Scarlets (votes, unanimous), from Mr. Chas. Turner, Slough. A large deep scarlet variety.

To Carnation Salamander (votes, 9 for, 3 against), from Mr. Chas. Turner. Deep rose.

To Picotee Nellie Bath (votes, unanimous), from Mr. Chas. Turner. Yellow, crimson edge.

To Picotee Duchess of Sutherland (votes, unanimous), from Mr. Chas. Turner. Flowers striped white.

To Picotee Old Coin (votes, 7 for, 6 against), from Mr. Chas. Turner. Rosy pink and crimson.

To Picotee Mrs. Arthur Barrett (votes, 7 for, 5 against), from Mr. Chas. Turner. Dull yellow, with red markings.

To Carnation Acme (votes, 6 for, 5 against), from Messrs. Pearson, Chilwell, Notts. A border variety, free and large; dull yellow with red mottling.

To Campanula pyramidalis compacta (votes, 10 for, 5 against), from the Duke of Northumberland, Syon House (gardener, Mr. G. Wythes). A dwarfer variety than the type, with deep blue flowers.

Cultural Commendation.

To Mr. T. Jannoch, Dersingham, King's Lynn, for spikes and foliage of Lily-of-the-Valley, which attracted attention owing to the season of the year.

Other Exhibits.

Twenty-four varieties of Sweet Peas, Eckford's strain, were exhibited from the Society's Gardens. They were arranged in large bunches with their own foliage. The Committee expressed their admiration of the exhibit and satisfaction with the mode of arrangement.

A pretty shaded pink Chrysanthemum was shown by Mr. W. Wells, Earlswood.

Messrs. Veitch exhibited a plant of *Vallota purpurea* var. *amabilis*, bearing white flowers slightly stained with green.

Aloe Gortoniana, a dwarf plant with dark green leaves spotted with pale green, was shown by Mr. P. McArthur, Maida Vale.

FLORAL COMMITTEE, AT CHISWICK, AUGUST 16, 1892.

W. MARSHALL, Esq., in the Chair, and two members present.

Awards Recommended:—

Highly Commended (× × ×).

To *Phlox decussata* varieties. (See pages cxvi, cxix, cxxxi.)

(A more complete report on the *Phloxes* will be published next year.)

- P. Amazon, from Mr. Forbes, Hawick, N.B.
- P. Boule de Feu, from Messrs. Paul & Son, Cheshunt.
- P. Burnouf, from M. V. Lemoine and Messrs. Dicksons.
- P. Croix de Sud, from Mr. Forbes.
- P. Countess of Mar, from Mr. Forbes.
- P. Delicata, from Mr. Forbes.
- P. Etna, from M. V. Lemoine, Nancy, France.
- P. Eclairer, from Mr. Forbes.
- P. Enchantment, from Mr. Forbes.
- P. Granville, from Messrs. Paul & Son and Mr. Forbes.
- P. Longchamps, from Mr. Forbes.
- P. Neptune, from Mr. Forbes.
- P. Nain Bebe, from Mr. Forbes.
- P. Pluton, from Mr. Forbes and Messrs. Dicksons.
- P. Paul Bert, from Mr. Forbes.
- P. Sam Ireland, from Mr. Forbes.
- P. Wm. Robinson, from Mr. Forbes and Messrs. Dicksons.

Commended (× ×).

- P. African, from Messrs. Dicksons, Chester.
- P. Bayard, from Mr. Forbes and Messrs. Paul & Son.
- P. Belvidere, from Mr. Forbes and Messrs. Paul & Son.
- P. Claudot, from Messrs. Paul & Son.
- P. Eugène Schotte, from Messrs. Paul & Son and Mr. Forbes.

P. Felibre, from Messrs. Dicksons.

P. Iris, from Messrs. Paul & Son, Dicksons, Forbes, and Lemoine.

P. La Fille de l'Air, from Messrs. Paul & Son.

P. Panthéon, from M. V. Lemoine.

P. Panorama, from Messrs. Dicksons, Paul & Son, and Forbes.

P. Regalis, from Mr. Forbes.

P. Thalie, from Messrs. Dicksons.

P. Wm. Muir, from Mr. Forbes.

FLORAL COMMITTEE, AUGUST 23, 1892.

CHISWICK CONFERENCE.

W. MARSHALL, Esq., in the Chair, and thirteen members present.

Awards Recommended:—

Silver Gilt Flora Medal.

To Messrs. H. Cannell & Sons, Swanley, for a large exhibit of Tuberous and Foliage Begonias, Cactus Dahlias, &c., arranged in two groups.

To Messrs. John Laing & Son, Forest Hill, for a large group of Tuberous and a few Foliage Begonias.

To Messrs. W. & J. Birkenhead, Sale, Manchester, for a large and very fine collection of hardy British Ferns.

Silver Flora Medal.

To Messrs. J. Veitch & Sons for an interesting group of Begonias.

To Messrs. de Rothschild, Gunnersbury House, Acton (gardener, Mr. J. Hudson), for a large group of well-grown Cape Pelargoniums.

To Messrs. Paul & Son, Cheshunt, for a collection of cut Roses and Phloxes.

To Mr. Thos. S. Ware, Tottenham, for a large collection of Hollyhocks (staged as grown) and cut Phloxes.

Silver Gilt Banksian Medal.

To Messrs. Kelway & Son, Langport, for a fine group of Gladioli and Gaillardias.

Silver Banksian Medal.

To Mr. H. B. May, Edmonton, for a small group of British Ferns.

Bronze Banksian Medal.

To Messrs. Pitcher & Manda for an extensive collection of cut Hardy Flowers.

To J. Currie, Esq., Edinburgh (gardener, Mr. McMillan), for a small collection of good blooms of the large-flowering Chrysanthemums.

First Class Certificate.

To *Nephrolepis davallioides multiceps* (votes, unanimous), from Mr. H. B. May, Edmonton. A handsome plant with much-divided fronds.

To *Pteris tremula variegata* (votes, unanimous), from Mr. H. B. May. A dwarf silvery variety.

To *Pteris Reginæ* (votes, unanimous) and *Pteris Reginæ cristata* (votes, unanimous), from Mr. H. B. May. Both very prettily variegated plants.

To *Helenium grandicephalum striatum* (votes, unanimous), from Mr. Thos. S. Ware. Flowers deep orange, with lighter stripes; very pretty.

To *Tilia platyphylla* (votes, unanimous), from the Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach.) A strong-growing and large-leaved species of Lime-tree.

To *Begonia Marie Louise* (votes, unanimous), from Messrs. J. Veitch & Sons. A very dwarf and attractive plant of the Rex class; bright green, with silver spots and nerves.

To *Begonia Mme. Alamangy* (votes, unanimous), from W. Marshall, Esq., Bexley. A strong-growing Rex variety, with deep green serrated leaves, having a wide silver margin.

To *Begonia semperflorens rubra*, Vernon's variety (votes, unanimous), from Messrs. Vilmorin, Paris, and to B. Crimson Gem, from Messrs. Sutton & Sons. These plants are identical, and are extremely attractive bedding-out plants, the foliage assuming a deep bronzy colour out of doors; the flowers are deep red and very small. (*See page cxv.*)

To *Asparagus deflexus* (votes, unanimous), from Messrs. de Rothschild, Gunnersbury House, Acton (gardener, Mr. J. Hudson). A fine plant suitable for growing in baskets; the drooping growths of the specimen exhibited were five feet or more long.

To *Scolopendrium vulgare blandissimum* and *S. v. crispum pendens* (votes, unanimous), from E. J. Lowe, Esq., F.R.S., Shirenewton Hall, and from Clifton Zoological Gardens.

To *Polystichum angulare plumosum angustum*; to *P. a. attractum*; to *P. a. longipinnulum* (votes, unanimous), from Shirenewton Hall and Clifton Zoological Gardens.

To *Polystichum aculeatum honorabile* (votes, unanimous), from Shirenewton Hall and Clifton Zoological Gardens.

To *Asplenium Ceterach aureum amplicandum* (votes, unanimous), from Shirenewton Hall and Clifton Zoological Gardens.

To *Pteris serrulata pendens* (votes, unanimous), from Shirenewton Hall and Clifton Zoological Gardens.

To *Asplenium* (*Athyrium*) *f. f. superbum pericristatum* and *Athyrium f. f. rotundatum aristatum* (votes, unanimous), from C. T. Druery, Esq., Forest Gate.

To *Aspidium aculeatum angulare inaccessum*; to *A. a. a. plumosum angustatum*; to *A. a. a. Rhea pinna*; to *A. a. a. divisilobum robustum*; to *A. a. a. attractum*; to *A. a. a. longipinnulum*; to *A. a. honorabile*; to *Scolopendrium vulgare crispum pendens* (votes, unanimous), from Shirenewton Hall and Clifton Zoological Gardens.

Award of Merit.

To *Adiantum elegantissimum* (votes, unanimous), from Mr. H. B. May, Edmonton. A graceful Maidenhair Fern, not quite so fine and more erect than *A. gracillimum*.

To *Athyrium setigerum Victoriae* (votes, 5 for, 2 against), from Messrs. W. & J. Birkenhead, Sale, Manchester. A curious form with narrow crested fronds.

To *Begonia* Earl of Cranbrook (votes, 5 for), from Messrs. J. Laing & Sons, Forest Hill. Orange-scarlet flowers.

To *Begonia* Duke of Fife (votes, 7 for), from Messrs. J. Laing & Sons. Large very double flowers, crimson.

To *Begonia* Lord Esher (votes, 6 for), from Messrs. J. Laing & Sons. Fine double, deep scarlet.

To Begonia Picotee (votes, 6 for, 2 against), from Messrs. J. Laing & Sons. Very pale yellow with pink-edged petals; very pretty.

To Begonia Lady Gertrude (votes, 7 for), from Messrs. J. Laing & Sons. Rosy pink, pale centre.

To Begonia Bertha McGregor (votes, unanimous), from Messrs. J. Laing & Sons. A Foliage Begonia of the Rex type, with dark green leaves margined with silver.

To Gladiolus Mr. Hobhouse (votes, unanimous), from Messrs. Kelway & Son, Langport. Deep rosy salmon.

To Gladiolus Private Secretary (votes, unanimous), from Messrs. Kelway & Son. Pink.

To Gladiolus Mr. MacAlister (votes, unanimous), from Messrs. Kelway & Son. Pale yellow.

To Phlox Eclairer (votes, 8 for, 1 against), from Messrs. Paul & Son, Cheshunt. Deep purplish rose, pale centre.

To Phlox Le Soleil (votes, 7 for), from Messrs. Paul & Son, Cheshunt. A fine variety, with large rosy-pink flowers, light centre.

To Phlox Michael Cervantes (votes, 6 for, 2 against), from Messrs. Paul & Son. Blush, rose centre.

To Coleus Distinction (votes, unanimous), from Mr. J. Morris, Acton. A very dark dwarf and sturdy variety.

To Carnation Mrs. Leopold de Rothschild (votes, unanimous), from Messrs. de Rothschild, Gunnersbury Park, Acton (gardener, Mr. G. Reynolds). Good habit; yellow flowers, clove-scented.

To Begonia Princess Beatrice (votes, unanimous), from Messrs. Sutton & Sons, Reading. A dwarf bedding variety; small leaves and very free flowering. It looked very handsome as planted in the bed at Chiswick this summer.

To Begonia multiflora L'Avenir (votes, 7 for), from Messrs. Vilmorin, Paris. A handsome variety with medium-sized double flowers, deep scarlet; free bloomer, dwarf habit.

To Begonia Louise Robert (votes, 7 for), from Messrs. Vilmorin. About nine inches high; large semi-double flowers, deep rose, pale rose centre.

To Begonia Mme. Louis Urban (votes, 7 for), from Messrs. Vilmorin. Dwarf, hardly more than six inches high; very dark foliage; flowers nodding, very double, over two inches across, deep rose-pink; a good variety.

To *Begonia rosea multiflora* (votes, 8 for), from Messrs. Vil-morin. Dwarf habit; leaves pale green; flowers salmon-pink, small, but produced freely.

These four varieties have been growing with others in the Society's Gardens at Chiswick, where they have attracted considerable attention.

Other Exhibits.

The Director of the Royal Gardens, Kew, exhibited a very large collection of species of *Begonias*, including several fine plants of *B. Haageana*. This group attracted very great attention from those interested in *Begonia* raising.

Mr. J. Bruce, Manchester, sent three hybrid *Vallotas*.

Messrs. J. Cheal & Sons, Crawley, exhibited a very dwarf Pompon *Dahlia* named *Crawley Bedder*.

Several dwarf *Cannas*, in flower, were shown by Mr. Thos. S. Ware, Tottenham.

Mr. G. Wythes, Syon House, sent boxes of *Pentstemons* and *Antirrhinums*.

Miss Debenham exhibited a small group of Summer-flowering *Chrysanthemums*.

FERN EXHIBITION AT CHISWICK,

AUGUST 23 AND 24, 1892.

THIS great show of Ferns originated with the late Major Cowburn, and the late Mrs. Grant had also intended to exhibit her beautiful collection. The late Mr. W. Barnard Hankey also interested himself greatly in the idea of the show, and he obtained several of the prizes. Thus death deprived the Society of many very fine specimens, and it rested with Mr. Lowe, F.R.S., and Mr. Druery, F.L.S., to do what they could to make a large display. In order that the names of some well-known Fern growers, who had done so much, but had, alas! passed away, should not be forgotten, it was further suggested by Major Cowburn to have memorial prizes, in memory of Colonel A. M. Jones of Clifton, Mr. E. F. Fox of Bristol, Mrs. Grant of Hillesdon, and Mr. W. C. Carbonell of Usk, and it was little thought then that Major Cowburn himself, who was then in the prime of

life, would have been so suddenly attacked by fatal illness, and the Society lose an energetic and successful horticulturist.

PRIZES.

- CLASS A.—Colonel A. M. Jones's Memorial Prize for 10 plumose varieties (no restriction of species). Given by his daughters and Capt. Stafford Jones. Silver Gilt Flora Medal and 10s. to E. J. Lowe, Esq., F.R.S., Shirenewton Hall, Chepstow, and Zoological Gardens, Clifton.
- CLASS B.—Mr. Edwin Fyde Fox's Memorial Prize for 10 cruciate or narrow varieties (no restriction of species). Given by his sons, Dr. E. Churchill Fox and Dr. Arthur E. W. Fox, and his brother, Mr. G. F. Fox. Silver Gilt Flora Medal and 10s. to E. J. Lowe, Esq., and Zoological Gardens, Clifton.
- CLASS C.—Mrs. Maria Grant's Memorial Prize for 10 varieties of *Athyrium Filix-femina*. Given by her son, Mr. W. J. A. Grant. Silver Gilt Flora Medal and 10s. to E. J. Lowe, Esq., and Zoological Gardens, Clifton.
- CLASS D.—Mr. William Charles Carbonell's Memorial Prize for 10 varieties of *Polystichum aculeatum* and hybrids with *P. aculeatum*. Given by "the Family." Silver Gilt Flora Medal and 10s. to E. J. Lowe, Esq., and Zoological Gardens, Clifton.
- CLASS E.—16 varieties (no restriction of species). Given by the Clifton Zoological Gardens, Mr. E. Lowe, F.R.S., and Major Cowburn, F.R.H.S. First prize, Silver Gilt Flora Medal and 50s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton. Second prize, 30s., to C. T. Druery, Esq., F.L.S., Fernholme, Windsor Road, Forest Gate.
- CLASS F.—16 dwarf or congested varieties (no restriction of species). Given by the Hon. Mrs. Brassey, F.R.H.S., and Mrs. A. Hodgson. First prize, Silver Flora Medal and 20s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton.
- CLASS G.—8 varieties (no restriction of species). First prize, Silver Flora Medal and 25s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton. Second prize, 10s., to C. T. Druery, Esq., Fernholme, Windsor Road, Forest Gate.
- CLASS H.—8 varieties of *Nephrodium Filix-mas* (including *N. paleaceum*). First prize, Silver Flora Medal and 20s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton. Classes G

and H given by Mr. W. Barnard Hankey, F.R.H.S., Mr. C. T. Drury, F.L.S., Mr. R. A. Thompson, Mr. E. T. Pease, and Mr. A. E. G. Way.

CLASS I.—10 varieties of *Scolopendrium vulgare*. First prize, Silver Flora Medal and 20s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton.

CLASS K.—8 varieties of *Polystichum angulare*. First prize, Silver Flora Medal and 20s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton. Second prize, Bronze Flora Medal and 10s., to C. T. Drury, Esq., Fernholme, Windsor Road, Forest Gate. Classes I and K given by Mr. Jonathan Rashleigh, F.R.H.S., Mr. J. A. Rolls, F.R.H.S., Mr. R. Clive, F.R.H.S., Mr. P. Neill Fraser, and Mr. W. B. Boyd.

CLASS L.—8 crested or capitate varieties (no restriction of species). Given by Mr. J. W. Leavers, F.R.H.S., Mr. F. J. Clark, and Dr. Stansfield. First prize, Silver Flora Medal and 20s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton.

CLASS M.—4 varieties, restricted to species not included in C, D, H, I, K, N, or Q. Given by Alderman Ellis, Mr. W. S. Lang, and Mr. O. Firth. First prize, Bronze Flora Medal and 10s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton. Second prize, 5s., to W. Marshall, Esq., Auchinraith, Bexley.

CLASS N.—4 varieties of *Polypodium vulgare*. Given by Mr. W. Birkenhead, F.R.H.S., and Mr. J. Birkenhead, F.R.H.S. Silver Flora Medal and 10s. to E. J. Lowe, Esq., and Zoological Gardens, Clifton.

CLASS O.—8 rugose or muricate varieties (no restriction of species). Given by Mr. J. E. Mapplebeck, F.R.H.S. First prize, Silver Banksian Medal and 10s., to E. J. Lowe, Esq., and Zoological Gardens, Clifton.

CLASS P.—4 Adiantums. Given by Mrs. Thomas. Bronze Flora Medal and 5s. to E. J. Lowe, Esq., and Zoological Gardens, Clifton.

CLASS Q.—10 wild varieties of Aspleniums (including Cetarach). Given by Mr. P. B. O'Kelly. Bronze Flora Medal to E. J. Lowe, Esq., and Zoological Gardens, Clifton.

PRIZES FOR SINGLE PLANTS to be selected from all the Classes.

Best specimen. Given by Mr. W. H. Phillips. Bronze Flora Medal to W. Marshall, Esq., Auchinraith, Bexley, for *Polypodium vulgare trichomanoides*.

Best variety. Given by Mr. R. Lloyd Praeger, M.R.I.A. Bronze Flora Medal to C. T. Druery, Esq., Fernholme, Windsor Road, Forest Gate, for *Asplenium Filix-fœmina plumosum*.

Best variegated or golden variety. Given by Mr. James Moly. Bronze Flora Medal to E. J. Lowe, Esq., and Zoological Gardens, Clifton, for *Scolopendrium vulgare crispum* "Mrs. Cowburn."

Best Athyrium. Prize given by Mr. John Loraine Baldwin. Bronze Banksian Medal to C. T. Druery, Esq., Fernholme, Windsor Road, Forest Gate, for *Filix-fœmina plumosum Drueryi*.

Best Scolopendrium. Prize given by Mr. John Loraine Baldwin. Bronze Banksian Medal to E. J. Lowe, Esq., and Zoological Gardens, Clifton, for *S. vulgare crispum pendulum*.

Best Nephrodium. Prize given by Mr. John Loraine Baldwin. Bronze Banksian Medal to E. J. Lowe, Esq., and Zoological Gardens, Clifton, for *N. Filix-mas Padleyi*.

Best Polystichum. Prize given by Mr. John Loraine Baldwin. Bronze Banksian Medal to E. J. Lowe, Esq., and Zoological Gardens, Clifton, for *P. angulare inaccessum*.

Best Osmunda. Prize given by Mr. John Loraine Baldwin. Bronze Banksian Medal to E. J. Lowe, Esq., and Zoological Gardens, Clifton, for *O. regalis cristata*.

Best Polypodium. Prize given by Mr. John Loraine Baldwin. Bronze Banksian Medal to W. Marshall, Esq., Auchinraith, Bexley, for *P. vulgare trichomanoides*.

Best Adiantum. Prize given by Mr. J. H. Fitt. Bronze Banksian Medal to E. J. Lowe, Esq., and Zoological Gardens, Clifton, for *A. Capillus-Veneris* "Isabel."

Best Asplenium. Prize given by Mr. G. Gillett. Bronze Banksian Medal to E. J. Lowe, Esq., and Zoological Gardens, Clifton, for *A. Ceterach multifido-cristatum* "O'Kelly."

FLORAL COMMITTEE, AT CHISWICK, AUGUST 30, 1892.

W. MARSHALL, Esq., in the Chair, and three members present.

Awards Recommended :—

Highly Commended (× × ×).

To Phlox decussata varieties :

P. Panama, from Mr. Forbes, Hawick, N.B.

P. Faust, from M. V. Lemoine, Nancy.

P. Ornament, from Mr. Forbes.

P. Avalanche, from M. V. Lemoine, Mr. Forbes, and Messrs. Dicksons, Chester.

Commended (× ×).

P. Mrs. Laing, from Mr. Forbes.

P. Jeanne d'Arc, from Mr. Forbes, and Messrs. Paul & Son, Cheshunt.

FLORAL COMMITTEE, SEPTEMBER 6, 1892.

W. MARSHALL, Esq., in the Chair, and fifteen members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. Kelway & Son, Langport, for a fine collection of Gladioli, representing about eight dozen varieties.

Silver Banksian Medal.

To Messrs. Pitcher & Manda, Hextable, for a group of cut hardy herbaceous flowers, among which were Achilleas, Phloxes, Asters, Liliums, &c.

To Messrs. Hugh Low & Co., Clapton, for a nice group of Lilium Wallichianum superbum (L. sulphureum, Baker).

Bronze Flora Medal.

To Messrs. Cutbush & Son, Highgate, for a group of herbaceous plants, such as Solidagos, Veronicas, Helianthus, &c., and a box of Hollyhocks.

Bronze Banksian Medal.

To Mr. R. Dean, Ranelagh Road, Ealing, for a small group of flowers, showing good strains of China Asters, French Mari-golds, Pinks, Anemones, &c.

Award of Merit.

To Canna Star of '91 (votes, 4 for), grown at the Society's Gardens, from Mr. C. Allen, Floral Nursery, New York. A very pretty dwarf plant in the way of Mme. Crozy.

To Gladiolus Numa (votes, 6 for), from Messrs. Kelway & Son, Langport. A crimson variety with rosy lacing.

To Gladiolus Poetis (votes, 10 for), from Messrs. Kelway & Son. A pretty pale-buff variety.

To Cactus Dahlias Kaiserine (votes, 11 for), a fine clear yellow flower; Bertha Mawley (votes, unanimous), with pretty carmine flowers; Countess of Radnor (votes, unanimous), a fine glowing salmon; Mrs. Basham (votes, 7 for, 1 against), rosy pink, shaded with magenta, all from Messrs. Keynes, Williams & Co., Salisbury.

Other Exhibits.

Messrs. J. Veitch & Sons sent a basket of cut flowers of the brilliant salmon-rose coloured *Bignonia grandiflora* (*Bot. Mag.* t. 1398).

Messrs. Cannell & Sons staged some dwarf and well-grown "Cockcombs" and a box of Begonia blooms.

A hybrid Tacsonia named T. Smythiana was shown by Mr. Smythe, Basing Park Gardens.

Messrs. Pitcher & Manda exhibited a white Japanese Chrysanthemum named Sydenham White.

Passiflora Woodhatch Hybrid came from T. B. Haywood, Esq., Woodhatch Lodge, Reigate. It is a cross between *P. quadrangularis* (*Bot. Mag.* t. 2041) and *P. racemosa* (*Bot. Mag.* t. 2001). The flowers have a very dark centre.

Flowering branches of *Clerodendron trichotomum* (*Bot. Mag.* t. 6561) were shown by Messrs. J. Veitch & Sons, Chelsea. A perfectly hardy species, which grows into a bushy-headed tree.

FLORAL COMMITTEE, SEPTEMBER 20, 1892.

JOHN FRASER, Esq., in the Chair, and twenty-two members present.

Awards Recommended :—

Silver Gilt Floral Medal.

To Messrs. Dobbie & Co., Rothesay, N.B., for a large col-

lection of Dahlias (single and double varieties), Fuchsias, Violas, French and African Marigolds of good strain, Antirrhinums, &c.

Silver Banksian Medal.

To Mr. Rawlings, Romford, for a fine collection of Show Dahlias, consisting of over 150 flowers.

To Messrs. J. Laing & Sons, Forest Hill, for a large group of Codiaëums (Crotons), Dracænas, Caladiums, Palms, Adiantum Farleyense, &c.

To Messrs. B. S. Williams & Sons, Holloway, for a fine group of large and well-coloured Codiaëums, comprising such varieties as Chelsonii, Warrenii, Mrs. Swan, with drooping foliage, Queen Victoria, the old Disraeli, and the broad-leaved Stewartii.

Bronze Banksian Medal.

To Messrs. Paul & Son, Cheshunt, for a group of cut herbaceous flowers—Asters, Helianthus, Boltonias, Rudbeckias, Cyclamen, &c.

To Mr. Mortimer, Swiss Nursery, Farnham, for a collection of Show Dahlias.

To Mr. Holden, Ealing, for a miscellaneous group of Ferns, Begonias, Coleus, &c.

First Class Certificate.

To Aristolochia gigas var. Sturtevantii (votes, unanimous), from Messrs. F. Ross & Co., Merstham, Surrey. A fine stove Climber, probably the largest of the "Birthworts," the flowers measuring 20 inches in length and 16 inches in width, with a tail 2 feet to 3 feet in length. The colour is deep crimson and purple, with creamy veins and reticulations; the inside of the tube in the centre is a fine velvety maroon; a much finer plant than the type; leaves heart-shaped.

To Pteris nivalis (votes, unanimous), from Mr. H. B. May, Edmonton. A dwarf plant, with silvery variegation.

Award of Merit.

To Dobbie's strain of French Marigolds, from Messrs. Dobbie & Co., Rothesay, N.B.

To Pompon Dahlias Tommy Keith (votes, 10 for, 1 against), red petals tipped with white; and Arthur West (votes, 7 for, 5 against), a fine dark red, from W. Keith, Esq., Brentwood (gardener, Mr. West).

To Cactus Dahlia Matchless (votes, unanimous), from Messrs. Perkins & Sons, Coventry. A fine dark velvety maroon.

To Show Dahlia Kathleen (votes, 7 for), from Mr. Charles Turner, Slough. A fine variety, with shaded lilac petals.

To Silver Elder (*Sambucus nigra argentea variegata*) (votes, 11 for, 2 against), from Miss A. de Rothschild, Eythorpe, Aylesbury. A fine silvery variegated form, very effective and constant in character.

Other Exhibits.

Messrs. R. B. Laird & Sons exhibited a box of blooms of Carnation Heir Prince. A free-flowering, scarlet border variety.

C. E. Smith, Esq., Silvermere, Cobham (gardener, Mr. Quarterman), contributed three large baskets of Pine Cones representing several species.

Mr. H. B. May, Edmonton, staged a small group of new Ferns.

Messrs. J. Veitch & Sons, Chelsea, displayed a box of hybrid *Streptocarpus*.

Mr. R. Owen, Maidenhead, sent *Chrysanthemum* Princess May, a white variety near Mme. Desgrange; and C. Harvest Home, a bronze variety.

Messrs. Reid & Booneman sent *Chrysanthemum* George Jones.

Mr. Thos. S. Ware, Tottenham, sent a few varieties of single Dahlias and *Helianthus* Bouquet d'Or.

FLORAL COMMITTEE, OCTOBER 4, 1892.

W. MARSHALL, Esq., in the Chair, and twenty-four members present.

Awards Recommended:—

Silver Banksian Medal.

To Mr. Anthony Waterer, Knap Hill, Woking, for a group consisting of several plants of the wonderfully beautiful *Picea pungens argentea* and baskets of well-berried *Pernettyas*.

To Messrs. Barr & Sons, Covent Garden, for a large collection of species and varieties of Perennial Asters.

Bronze Banksian Medal.

To Mr. W. Wells, Earlswood, for a collection of cut blooms of Incurved, Japanese, and Reflexed Chrysanthemums.

To Messrs. E. D. Shuttleworth & Co., Fleet, Hants, for a collection of Perennial Asters.

First Class Certificate.

To *Tacsonia Smythiana* (votes, unanimous), from W. Nicholson, Esq., Basing Park, Alton (gardener, Mr. W. Smythe). A hybrid between *T. mollissima* and some other species, although reputed to have been raised from *T. manicata* and *T. exoniensis*; the sepals and petals are a bright red, giving the flowers a very attractive appearance. The specimens shown were cut from a plant growing on an open wall.

To *Dracæna australis rubra* (votes, 16 for), from Mr. H. Elliott, Stourvale, Christchurch. A tall and handsome variety, with dull red leaves.

To *Rhododendron multicolor* var. *Neptune* (votes, unanimous), from Messrs. James Veitch & Sons, Chelsea. A new hybrid produced from the Javanese species. The plant exhibited was about 15 inches high, with small dark shiny leaves, and carried seven trusses with an aggregate of forty flowers. The individual flowers were $1\frac{1}{2}$ inch across, and of an intense crimson-scarlet.

To *Hymenanthera crassifolia* (votes, 16 for), from Messrs. J. Veitch & Sons, Chelsea. A hardy dwarf shrub, native of New Zealand, with stiff growth and leaves, bearing quantities of silvery-white berries.

Award of Merit.

To *Dahlia* Mrs. Vagg (votes, 13 for, 1 against), from Mr. Rawlings, Romford. A pale mauve show variety.

To *Chrysanthemum* General Hawkes (votes, 16 for, 1 against), from Mr. R. Owen, Castle Hill, Maidenhead. A dark purplish-crimson Japanese variety.

To *Chrysanthemum* (reflexed) Lady Brooke (votes, unanimous), from Mr. R. Owen. Buff, with yellow centre.

Both of the above varieties are English seedlings.

Other Exhibits.

Mr. J. Crook, The Gardens, Forde Abbey, sent cut specimens of Perennial Asters, *Rondeletias*, and *Gloriosas*.

H. Southall, Esq., The Craig, Ross, exhibited an extensive collection of species and varieties of Perennial Asters.

His Grace the Duke of Northumberland, Albury Park (gardener, Mr. W. C. Leach), sent a group of Mignonette Her Majesty, in pots.

The Rev. W. Wilks, Shirley Vicarage, Croydon, sent Aster John Wood and a good variety of *A. decorus*.

Messrs. J. Laing & Sons, Forest Hill, sent several boxes of *Saxifraga sarmentosa* var. *tricolor* *superba*.

Messrs. Pitcher & Manda, Hextable, Swanley, exhibited variegated forms of *Adiantum cuneatum* and *Anthurium crystallinum*, which the Committee wished to see again.

Messrs. Thos. S. Ware & Son, Hale Farm, Tottenham, sent flowering plants of the rare *Iris alata*, a very dwarf species, also a small group of Tree Carnations and a few Nerines.

Messrs. Jas. Veitch & Sons, Chelsea, sent a basket of handsome plants of *Amasonia calycina* (*A. punicea*).

Messrs. Hugh Low & Co., Clapton, sent *Alocasia Edwardii*, a dwarf Aroid with deep bronzy-green leaves.

Mr. Thos. Hobbs, St. Mark's Road, Bristol, sent *Dahlia* Mrs. Hobbs. A dark maroon Cactus variety.

From the Society's Gardens, Chiswick, came an extensive and correctly named collection of Perennial Asters.

Prizes.

Class 1.—Eighteen bunches of Hardy Herbaceous Perennials. Bulbs admissible. *First Prize*, Silver Gilt Flora Medal and £2, to the Earl of Dysart, Ham House, Richmond (gardener, Mr. Sage).

Class 2.—Twelve bunches of Hardy Herbaceous Perennials. Bulbs admissible. *First Prize*, Silver Flora Medal and £1. 10s., to W. Hall, Esq., Coker Court, Yeovil (gardener, Mr. Kidley). *Second Prize*, £1, to Mr. J. Gibson, The Oaks Gardens, Carshalton.

Class 3.—Eight bunches of Hardy Herbaceous Perennials. Bulbs admissible. *First Prize*, Bronze Flora Medal and £1, to Mr. J. Hudson, Gunnersbury House. *Second Prize*, 15s., to Miss Debenham, St. Peter's, St. Albans.

FLORAL COMMITTEE, OCTOBER 18, 1892.

W. MARSHALL, Esq., in the Chair, and twenty-five members present.

Awards Recommended :—*Silver Gilt Flora Medal.*

To Mr. H. B. May, Dyson's Lane, Edmonton, for a large group of Foliage Plants, well arranged, including some handsomely coloured plants of *Phrynium variegatum*.

To Messrs. E. D. Shuttleworth & Co., Fleet, Hants, for a group of well-grown Cycads, principally *C. revoluta*.

Silver Banksian Medal.

To His Grace the Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach), for a collection of highly coloured Autumn Foliage.

To Messrs. H. Cannell & Sons, Swanley, for a group of seedling Begonias.

Bronze Banksian Medal.

To Dr. Frankland, F.R.S., The Yews, Reigate Hill, for a collection of *Chrysanthemum* blooms of excellent quality.

Award of Merit.

To *Chrysanthemum* Beauty of Exmouth (votes, 14 for, 1 against), from Mr. J. Godfrey, Rolle Street, Exmouth. A white Japanese variety with twisted rays.

To *Chrysanthemum* William Seward (votes, unanimous), from Mr. W. Seward, The Firs, Boston Road, Hanwell. Japanese; deep crimson-maroon; fine flowers.

To *Chrysanthemum* Mrs. C. Myers (votes, 10 for, 7 against), from Mr. Robt. Owen, Maidenhead. A reflexed decorative variety; pale straw colour.

To *Chrysanthemum* Baron Hirsch (votes, unanimous), from Mr. R. Owen, Maidenhead. An incurved variety; deep bronzed.

To *Pelargonium* Raspail Improved (votes, 20 for), from Messrs. H. Cannell & Sons, Swanley. Dwarf plant, with trusses of very large and double scarlet flowers.

To *Pelargonium* Mme. Bondeville (votes, 13 for), from Messrs. H. Cannell & Sons. A single variety.

Cultural Commendation.

To Mr. T. Bones, Tower House Gardens, Chiswick, for *Nerine crispa*, well-flowered examples.

Other Exhibits.

Mr. Anthony Waterer, Knap Hill, Woking, exhibited some highly coloured *Berberis* and foliage of his *Scarlet Oak*.

Mr. W. Wells, Earlswood, showed several stands of *Chrysanthemums*.

Mr. A. Knowles, Horsell, near Woking, sent a box of well-flowered plants of *Daphne cneorum*.

Mr. Owen Thomas, Royal Gardens, Frogmore, sent an interesting group of seedling *Carnations*.

Messrs. de Rothschild, Gunnersbury House (gardener, Mr. J. Hudson), sent some cut sprays of *Ixora Westii*.

Messrs. H. Low & Co., Clapton, sent a plant of the old *Hippeastrum equestre*.

Messrs. H. J. Jones, Ryecroft, Lewisham, exhibited several new varieties of *Chrysanthemums*, one of which, *Mme. Ed. Reg*, the Committee wished to see again.

FLORAL COMMITTEE, NOVEMBER 1, 1892.

W. MARSHALL, Esq., in the Chair, and fifteen members present.

Awards Recommended :—

Gold Flora Medal.

To Messrs. James Veitch & Sons, Chelsea, for a fine group of *Nepenthes*. Thirty-one varieties were shown, including *N. Mastersiana*, *N. Chelsonii*, *N. Rafflesiana*, the distinct *N. Burkei* and its variety *excellens*, and the curious *N. Curtisii* and its variety *superba*. Such a magnificent display of *Nepenthes* has probably never been seen at any of the Society's Meetings before.

Silver Banksian Medal.

To J. Morgan, Esq., Dover House, Roehampton (gardener, Mr. McLeod), for a group of well-flowered *Bouvardias*.

First Class Certificate.

To *Hoya imperialis* (votes, 11 for), from Mr. F. W. Moore, Glasnevin Botanic Gardens, Dublin. The specimen exhibited consisted of a piece of growth and one umbel of thirteen large

flowers, each two inches across, stiff, livid purple with whitish raised centre bearing five white carpels. Although not new, this is a somewhat rare plant. (*Bot. Mag.* t. 4397.)

Award of Merit.

To *Codiaeum* (*Croton*) *Beatrice* Horsfall (votes, 9 for), from Mrs. Horsfall, Bellamour, Rugeley, Staffs. (gardener, Mr. Morrell). This is a sport from *C. interruptum*, which it very much resembles; the leaves are somewhat narrower, and the yellow and deep crimson colours more distinct.

To *Chrysanthemum* *Vesuvius* (votes, 9 for, 4 against), from Mr. Robert Owen, Maidenhead. Dark yellow Japanese variety. The award was given in regard to its decorative value.

To *Chrysanthemum* *Golden Ball* (votes, 10 for, 1 against), from Messrs. H. Cannell & Sons, Swanley. A fine golden yellow reflexed decorative variety.

To *Chrysanthemum* *W. H. Atkinson* (votes, 7 for), from Mr. H. J. Jones, Ryecroft Nurseries, Lewisham. A large spreading Japanese variety; dull red, yellowish on the reverse side.

To *Chrysanthemum* *Emily Doone* (votes, unanimous), from Messrs. J. R. Pearson, Chilwell, Notts. A beautiful pink Japanese variety, with yellow centre.

Other Exhibits.

Mr. Mackellar, Abney Hall Gardens, Cheadle, Cheshire, sent two fine trusses of *Ixora macrothyrsa* (*I. Duffii*).

Lord Rothschild, Tring Park (gardener, Mr. E. Hill), exhibited *Carnation* *Baronne Rothschild*.

Mr. A. Porter, Stone House, Maidstone, showed some of his patent "Invincible crocks."

Lady Cave, Cleve Hall, Downend, sent a spathe of *Rhaphidophora lancifolia*.

Messrs. J. Veitch & Sons, Chelsea, exhibited plants of the spineless *Pandanus Baptistii*, and *Begonia barbata*, a species from Penang, with dwarf bronzy leaves and greenish-yellow veins.

Messrs. H. Cannell & Sons, Swanley, exhibited some fine *Chrysanthemum* blooms, notably a stand of *Viviana Morel* and a stand of *Colonel W. B. Smith*, the latter being an exceedingly fine Japanese variety in the way of *Comte de Germiny*, with dull yellow and bronze flowers.

Prizes.

Class 1.—Chrysanthemums, collection of cut blooms, distinct, each bloom to be shown as cut from the plant without any dressing, and to stand well above the moss covering the box. Sticks or wires for support admissible. Amateurs. *First Prize*, Silver Flora Medal and £2, to L. J. Baker, Esq., Ottershaw Park, Chertsey. *Second Prize*, £1. 10s., to Mr. George Wythes, gardener to the Duke of Northumberland, Syon House, Brentford.

Class 2.—Twelve New Chrysanthemums, cut blooms, distinct, sent out in the years 1890, 1891, or 1892. Amateurs. *First Prize*, Silver Flora Medal and £1, to Mrs. Whitbourn, Great Gearies, Ilford (gardener, Mr. James Douglas).

FLORAL COMMITTEE, NOVEMBER 15, 1892.

W. MARSHALL, Esq., in the Chair, and fourteen members present.

Awards Recommended :—

Silver Gilt Flora Medal.

To Mr. H. B. May, Dyson's Lane, Edmonton, for a large group of Ferns, containing good examples of *Lindsaya retusa*, *Nephrodium* (*Lastrea*) *patens* and *N. lepidum*, *Marattia Cooperi* and *Dicksonia* (*Cibotium*) *Reginæ*.

Silver Banksian Medal.

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for a collection of cut Chrysanthemums, arranged with small Palms and Ferns.

To Messrs. H. Cannell & Sons, Swanley, Kent, for a group of cut Zonal Pelargoniums. Winter-flowering varieties, all shown in good form.

First Class Certificate.

To *Begonia decora* (votes, 11 for), from Messrs. Jas. Veitch & Sons, Chelsea. A very pretty dwarf Malayan species, having rough bronzy-green leaves, with yellowish-green veins.

Award of Merit.

To Chrysanthemum Mr. Chas. Blick (votes, unanimous), from

Martin R. Smith, Esq., The Warren Gardens, Hayes Common (gardener, Mr. C. Blick). A large golden-yellow Japanese variety.

To Chrysanthemum Miss Dorothea Shea (votes, 9 for, 3 against), from Mr. C. E. Shea, The Elms, Foot's Cray, Kent. A fine Japanese variety, in the way of Val d'Andorre.

To Chrysanthemum Lord Brooke (votes, unanimous), from Messrs. H. Cannell & Sons, Swanley. An incurved Japanese variety; deep golden yellow, with crimson streaks at the ends of the petals.

To Chrysanthemum Aida (votes, 6 for, 5 against), from Messrs. H. Cannell & Sons. A Japanese variety; deep salmon-red, with pale yellow centre.

To Chrysanthemum Princess Victoria (votes, 11 for, 1 against), from W. Seward, Esq., The Firs, Hanwell. A large Japanese variety; white tinged with cream.

To Chrysanthemum Mrs. Needs (votes, unanimous), from J. R. Pearson & Sons, Chilwell, Notts. A beautiful Japanese variety, with much-divided petals; pink suffused with rose.

To Chrysanthemum Robt. Flowerday (votes, 10 for), from Messrs. Pearson. An incurved Japanese variety; deep red inside, silvery on the reverse.

Other Exhibits.

Mr. Miller, gardener to Lord Foley, Ruxley Lodge, Esher, sent a nice basketful of Marie Louise Violets.

Mr. E. Molyneux, Swanmore Park Gardens, Mr. J. Dibbens, Brockley, and Mr. Robt. Owen, Maidenhead, exhibited new varieties of Chrysanthemums.

Prize.

Group of Chrysanthemums, distinct (Pompons and singles excluded), each plant to carry not less than twenty-four blooms. No artificial training allowed other than simple staking out of the branches to avoid crowding. Pinching or cutting back the plants in a young stage optional. Amateurs. *First Prize*, Silver Gilt Flora Medal and £3, to Mr. George Wythes, gardener to the Duke of Northumberland, Syon House, Brentford.

FLORAL COMMITTEE, DECEMBER 13, 1892.

W. MARSHALL, Esq., in the Chair, and twenty-three members present.

Awards Recommended :—*Silver Flora Medal.*

To Messrs. Paul & Son, Cheshunt, for a group of berry-bearing plants, consisting of Pernettyas, Aucubas, Hedera, sprigs of an immense number of varieties of Holly, together with Azalea mollis in flower, winter-flowering Cannas, &c.

To Mr. H. B. May, Upper Edmonton, for a group of well-grown and finely coloured Codiaëums (Crotons) in small pots.

To Mr. R. Owen, Maidenhead, for a large collection of cut Chrysanthemums, noticeable among these being Waban (Jap.), H. M. Pollett (Jap.), Peter Blair (Jap.), Lord Brook (incurved Jap.), and Enterprise (Jap. Anem.), lemon cushion, pink guard-petals.

Silver Banksian Medal.

To the Duke of Sutherland, Trentham Gardens, Stoke-on-Trent (gardener, Mr. P. Blair), for a group of Chrysanthemums (cut blooms)—twenty-four Japanese and twenty-four incurved—specially noticeable being Golden Empress (incurved), Mrs. R. King (incurved), Jeanne Delaux (Jap.), Mrs. Clarke (Jap.), and Etoile de Lyon (Jap.).

To Messrs. Pitcher & Manda, Hextable, Swanley, for a collection of cut Chrysanthemums, the following being very noticeable: Mrs. Lay, Waban, and Pearl Beauty.

To Messrs. Cannell & Sons, Swanley, for a group of splendidly grown and well-flowered Cyclamen. Flowers white, crimson, and rose.

Bronze Banksian Medal.

To Mr. Wells, Earlswood, Redhill, for a group of very fine Chrysanthemums (cut flowers).

First Class Certificate.

To Camellia Sasanqua (votes, 13 for, 1 against), from Messrs. J. Veitch & Sons. In growth the plant develops a somewhat climbing tendency. Flowers single, red. Hardy.

Award of Merit.

To Chrysanthemum Robert Owen (Jap. incurved) (votes, unanimous), from Mr. R. Owen, Maidenhead.

To Chrysanthemum Viscountess Hambleden (Jap. incurved) (votes, unanimous), from Mr. R. Owen, Maidenhead.

To Chrysanthemum Waban (Jap.) (votes, unanimous), from Mr. Robert Owen, Maidenhead.

To Chrysanthemum Enterprise (Jap. Anem.) (votes, unanimous), from Mr. Robert Owen, Maidenhead. Flowers lemon cushion, pink guard-petals.

To Chrysanthemum Fred Dorner (votes, 15 for, 1 against), from Messrs. J. R. Pearson & Sons, Chilwell.

To Chrysanthemum Mlle. Marie Recouva (votes, 9 for), from Messrs. Cannell & Sons, Swanley. A useful decorative late-flowering variety.

To Chrysanthemum Mrs. Robinson King (votes, unanimous), from the Duke of Sutherland, Trentham Hall (gardener, Mr. P. Blair). A Japanese incurved variety, with canary-coloured flowers.

Other Exhibits.

The Duke of Northumberland, Syon Gardens, Brentford (gardener, Mr. G. Wythes), sent a large group of decorative Chrysanthemums.

Mr. T. S. Ware, Tottenham, exhibited Iris Histrio and Narcissus monophyllus.

From Messrs. Pitcher & Manda came eleven varieties of Chrysanthemums, cut blooms, two of which the Committee desired to see next November: Mrs. Lay and Mrs. E. D. Adams.

Mr. Robert Owen, Maidenhead, sent cut blooms of nine varieties of Chrysanthemums, of which four gained Awards of Merit; and Eleanor D. Smith, Peter Blair, and H. M. Pollett the Committee asked to see again.

Messrs. J. R. Pearson & Sons, Chilwell, Notts, sent cut blooms of seven varieties of Chrysanthemums.

Mr. W. Wells, Earlswood, Redhill, sent flowers of Chrysanthemums Kate Wells and Carrie Wells.

T. B. Haywood, Esq., Woodhatch Lodge, Reigate, sent cut blooms of Chrysanthemum R. C. Kingston.

Mr. John Roberts, Tan-y-Bwlch, R.S.O., N. Wales, sent Violet Marie Louise and Carnation Whipper-in.

Mr. John Crook, Forde Abbey, Chard, sent cut flowers of *Primula obconica* (seedling). Flowers somewhat darker than the type.

Messrs. J. Veitch & Sons, Chelsea, sent *Camellia Sasanqua*. Flowers double white; hardy.

Messrs. J. Veitch & Sons, Chelsea, sent *Begonia Winter Gem*. Free-flowering, deep scarlet; exceedingly pretty.

Prize.

Collection of *Helleborus niger* varieties. *First prize*, Bronze Flora Medal and £1, to the Duke of Northumberland, Syon Gardens, Brentford (gardener, Mr. G. Wythes).

ORCHID COMMITTEE.

JANUARY 12, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and fourteen members present.

Awards Recommended:—

First Class Certificate.

To *Lælio-Cattleya Cassiope* × (*L. pumila* ♀ × *L.-C. exoniensis* × ♂) (votes, unanimous), from Messrs. Jas. Veitch & Sons, Chelsea. A fine hybrid with the dwarf habit of *Lælia pumila*, but with large bright rosy-crimson flowers, like those of *L.-C. exoniensis* ×.

To *Epidendrum Endresio-Wallisii* × (*E. Wallisii* ♀ × *Endresii* ♂) (votes, unanimous), from Messrs. Jas. Veitch & Sons. This very singular hybrid is in most particulars intermediate between the two parents, but the slight violet spotting in *E. Endresii* and the purple lines in the lip of *E. Wallisii* seem to have developed the purple hue in the seedling in an unexpected manner.

To *Lælia anceps Ballantinei* (votes, unanimous), from G. Douglas, Esq., Dalkeith, N.B. A beautiful variety near to

L. a. Amesiana ; sepals and petals white, with a crimson feather and flush over each, and dark maroon front to the labellum.

To *Cypripedium Calypso* ×, Oakwood var. (votes, unanimous), from Norman C. Cookson, Esq., Oakwood, Wylam-on-Tyne. This is larger than the original form, and with brighter purplish-crimson markings on the large white upper sepal.

To *Lælia furfuracea*, Lucas's var. (votes, unanimous), from C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan). A form of the old but still rare species, with larger and brighter coloured flowers and a broader labellum than the type.

Award of Merit.

To *Cypripedium gigas* × (*C. Lawrenceanum* ♀ × *C. Harrisianum nigrum* ♂) (votes, unanimous), from Chas. Ingram, Esq., Elstead House, Godalming (gardener, Mr. T. W. Bond). A fine hybrid with the flat circular upper sepal of *C. Lawrenceanum*, but with a nearly black base and radiating lines extending into the white margin. The petals and labellum resemble those of *C. Harrisianum*, but are larger and darker in colour.

To *Cypripedium enfieldiense* × (*C. Hookeræ* ♀ × *C. Lawrenceanum* ♂) (votes, unanimous), from H. M. Pollett, Esq., Fernside, Bickley, Kent (gardener, Mr. Parks).

To *Odontoglossum Rossii albens* (votes, unanimous), from Messrs. Charlesworth, Shuttleworth & Co., Heaton, Bradford, and Park Road, Clapham. This form has very light flowers, the only colour being a slight freckling of sap-green on the sepals.

Botanical Certificate.

To *Angræcum polyurum* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. One of the *A. bilobum* section, with nearly equal ovate-lanceolate white sepals and petals, and curiously interlacing cinnamon-coloured tails 3 inches long.

Other Exhibits.

Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine), exhibited cut flowers of many rare Orchids, including *Phaio-Calanthe Sedeni* ×, *Odontoglossum crispum Schröderianum*, a new yellow form of *Cypripedium insigne*, several varieties of *C. Leea* ×, *C. nitens* ×, *Odontoglossum Wattianum*, a

large form of *Cypripedium Lathamianum* \times , *Lælia anceps Sanderiana*, and other forms of *L. anceps*.

The Right Hon. Joseph Chamberlain, M.P., Highbury, Moor Green, Birmingham (Orchid grower, Mr. Burberry), sent a four-flowered spike of *Lælia anceps Sanderiana*.

C. J. Lucas, Esq., staged cut flowers of a fine form of *Pescatorea Klabochiana*, *Dendrobium aureum zeylanicum*, *Cypripedium Ainsworthii* \times , *C. Sedeni candidulum* \times , *Lælia anceps Hillii*, *L. a. Sanderiana*, *L. a. Stella*, &c.

The Earl of Cork and Orrery, Marston House, Frome (gardener, Mr. W. Iggulden), sent a three-flowered portion of a spike of a large variety of *Arachnanthe (Vanda) Cathcartii*, for which a special vote of thanks was recommended.

Messrs. F. Sander & Co., St. Albans, exhibited a group of cut Orchids, comprising the fine *Cypripedium nitens* \times , *St. Albans* var.; *C. Leeatum princeps* \times , *C. L. Masereelianum* \times , *C. Louryanum* \times , *C. Macfarlanei* \times , and other *Cypripediums*, and the fine white *Lælia anceps Schröderiana*.

W. H. Evans, Esq., Forde Abbey, Chard, Somerset (gardener, Mr. John Crook), sent to be named bunches of *Cœlogyne corrugata* and spikes of *Angræcum eburneum virens*.

Messrs. Pitcher & Manda, the United States Nurseries, Hextable, Swanley, Kent, exhibited plants of *Cypripedium Germinyanum* \times (*C. villosum* φ \times *C. hirsutissimum* σ) and *C. Godseffianum* \times (*C. Boxalli* φ \times *C. hirsutissimum* σ).

Messrs. Heath & Son, Cheltenham, sent the new hybrid *Cypripedium Swinburnei* \times (*C. insigne Maulei* φ \times *C. Argus Moensii* σ), a variety greatly resembling a good *C. Ashburtoniæ* \times , but with dark purple spots on the petals and upper sepal.

Messrs. Charlesworth, Shuttleworth & Co. exhibited the large-flowered *Lælia præstans*, *Heaton* var.

H. M. Pollett, Esq., showed a hybrid *Cypripedium (C. Spicerianum* φ \times *C. marmarophyllum* σ).

Chas. Ingram, Esq., sent *Cypripedium venusto-Spicerianum* \times .

Norman C. Cookson, Esq., Wylam-on-Tyne, exhibited two fine spikes of a hybrid *Calanthe (C. vestita rubra* φ \times *C. Williamsii* σ). The Committee expressed a desire to see the plant when next in bloom.

ORCHID COMMITTEE, FEBRUARY 9, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and fifteen members present.

Awards Recommended :—*Silver Gilt Flora Medal.*

To Messrs. Hugh Low & Co., Clapton, E., for an extensive group of Orchids, among which were *Phalænopsis casta*, *P. Brymeriana*, and various other species; a quantity of *Vanda Amesiana*, *Cattleya Percivaliana*, the white *Calanthe nivalis*, *Vanda Boxalli lutea*, many *Saccolabium bellinum*, *Dendrobium Wardianum Lowii*, a spike of *Renanthera Lowii*, *Cypripediums*, *Dendrobiums*, &c.

Silver Flora Medal.

To Messrs. B. S. Williams & Son, Upper Holloway, for a group of Orchids, consisting chiefly of rare *Cypripediums*.

Silver Banksian Medal.

To Messrs. F. Sander & Co., St. Albans, for a group of rare Orchids, in which *Oncidium splendidum* and varieties of *O. Phalænopsis* were prominent.

First Class Certificate.

To *Odontoglossum crispum nobilior* (votes, unanimous), from Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine). This is a very fine spotted variety, the sepals being almost covered with reddish-brown blotches, the petals and labellum being also heavily marked.

To *Odontoglossum Pescatorei Schröderianum* (votes, unanimous), from Baron Schröder. A variety handsomely blotched with violet-purple, and second only to *O. P. Veitchianum*.

To *Cypripedium Juno* × (*C. Fairieanum* ♀ × *C. callosum* ♂) (votes, unanimous), from Drewett O. Drewett, Esq., Riding-Mill-on-Tyne (gardener, Mr. A. J. Keeling). This fine hybrid somewhat resembles *C. vexillarium* ×, on which it is a great improvement.

To *Zygopetalum leucochilum* × (*Z. Burkei* ♀ × *Z. Mackaii* ♂) (votes, unanimous), from Messrs. Jas. Veitch & Son.

A remarkably fine hybrid, rendered very attractive by the white labellum.

To *Cypripedium Adrastus* \times (*C. Leeanum* φ \times *C. Boxalli* σ) (votes, unanimous), a noble hybrid from Messrs. James Veitch & Son.

Award of Merit.

To *Dendrobium splendidissimum* *Leeanum* \times (*D. nobile pendulum* φ \times *D. aureum philippinense* σ) (votes, unanimous), from W. R. Lee, Esq., Audenshaw, Manchester. This is a distinct and floriferous variety, some of the pseudo-bulbs producing over thirty flowers in spikes of four to five each.

To *Dendrobium Cassiope* \times (*D. japonicum* φ \times *D. nobile albiflorum* σ) (votes, unanimous), from Norman C. Cookson, Esq., Wylam-on-Tyne. A pretty dwarf white variety.

To *Lycaste Youngii*, hort. (votes, unanimous), from Sir Trevor Lawrence, Bart., and from Messrs. B. S. Williams & Son. A citron-yellow species.

To *Odontoglossum ioplocon* (votes, unanimous), a fragrant violet-coloured species near to *O. Edwardii*, from Baron Schröder.

To *Cypripedium Ceres* \times (*C. hirsutissimum* φ \times *C. Spicerianum* σ) (votes, unanimous), from Drewett O. Drewett, Esq. This is the best of the *C. hirsutissimum* hybrids up to the present time.

To *Cypripedium insigne*, Cambridge Lodge variety (votes, unanimous), from R. I. Measures, Esq., Cambridge Lodge, Camberwell (gardener, Mr. H. Simpkins). This is a charming variety like a small *C. i. violaceo-punctatum*.

Botanical Certificate.

To *Cynorchis Lowii* (votes, unanimous), from F. W. Moore, Esq., Botanic Gardens, Glasnevin.

To *Epidendrum Watsonianum* (votes, unanimous), from Messrs. F. Sander & Co.

To *Trichocentrum triquetrum* (votes, unanimous), from Sir Trevor Lawrence, Bart.

To *Dendrobium Fœlschii* (votes, unanimous), from Sir Trevor Lawrence, Bart.

To *Cypripedium Lindleyanum* (votes, unanimous), from Drewett O. Drewett, Esq.

Cultural Commendation.

To Lord Foley, Ruxley Lodge, Esher, for a group of *Cœlogyne cristata*.

Other Exhibits.

Sir Trevor Lawrence, Bart., sent *Dendrobium chrysodiscus* × and *Phalænopsis Stuartiana punctatissima*.

Charles Ingram, Esq., Elstead House, Godalming (gardener, Mr. T. W. Bond), showed *Cypripedium Lathamianum* ×, a reverse cross to the original; *C. La Nymphe* × (*C. cœnanthum* ♀ × *C. Dauthierii* × ♂); a spike of a fine form of *Phalænopsis Sanderiana*, and ten varieties of *Cattleya Trianaë*.

F. Wigan, Esq., Clare Lawn, East Sheen (grower, Mr. W. H. Young), staged a group of cut spikes of *Phalænopsis Schilleriana* and *P. Stuartiana*, *Dendrobium speciosum*, *Cattleya labiata* *Ludde-manniana* and *C. Percivaliana*, all exhibiting evidence of good culture.

Mrs. Adair, Beechwood Park, Dunstable (gardener, Mr. J. Freeman), showed a plant of the rare *Cattleya Percivaliana alba* and flowers of a large light-coloured *Cattleya Trianaë*.

R. N. Dale, Esq., Bromborough Hall, Cheshire, sent cut examples of a very fine, large, nearly white *Cattleya Trianaë*, *Lælia anceps Sanderiana*, *Odontoglossum Rossii albens*, a fine form of *Phaius Humblotii*, &c.

Mrs. Arbuthnot, Bridgen Place, Bexley (gardener, Mr. Mitchell), exhibited the rare *Vanda concolor*.

J. F. Ebner, Esq., Horton House, Beckenham (grower, Mr. C. Franklin), sent *Cypripedium Savageanum superbum* × and *C. villosum*, Horton House var., a very large form of the species.

E. G. Wrigley, Esq., Victoria House, Dukinfield, Cheshire (gardener, Mr. C. Harris), sent a curious small-flowered *Dendrobium lituiflorum* and a small variety of *D. Wardianum*.

Charles Winn, Esq., Selly Hill, Birmingham, sent a hybrid *Dendrobium*, which the Committee identified as *D. Aspasia* ×.

R. I. Measures, Esq., Cambridge Lodge, Flodden Road, Camberwell (gardener, Mr. H. Simpkins), staged specimens of *Cypripedium Lathamianum* ×, obtained from the reverse cross to the original variety, but not differing materially; also *C. insigne Chantinii* ♀ × *C. villosum* ♂, a hybrid much resembling *C. Sallierii*.

T. Statter, Esq., Stand Hall, Whitefield, Manchester, exhibited cut specimens of *Oncidium loxense*, *Odontoglossum ramosissimum*, varieties of *Lælia anceps*, *Sophranites grandiflora*, and *Lycaste Skinnerii alba*.

Messrs. James Veitch & Son exhibited *Dendrobium dulce* × (*D. aureum* ♀ × *D. Linawianum* ♂) with a pretty rose-tinted flower, and *Cypripedium Sedeni candidulum* ×.

F. T. Studd, Esq., Wimbledon Park (gardener, Mr. John Curtis), staged a well-grown specimen of *Cœlogyne cristata*.

Messrs. Seeger & Tropp, Lordship Lane, East Dulwich, exhibited a fine *Masdevallia macrura*, *M. towarensis* and others, *Cirrhopetalum picturatum*, *Odontoglossum blandum*, &c.

Mr. James Crispin, Fishponds, Bristol, exhibited a large form of *Lælia furfuracea*, cut spikes of *Saccolabium giganteum*, *Odontoglossum Edwardii*, &c.

F. W. Moore, Esq., Royal Botanic Gardens, Glasnevin, Dublin, sent cut flowers of *Cynorchis Lowii* and *Restrepia striata*.

Mr. H. A. Tracy, Twickenham, showed the fine *Cattleya Trianae*, Tracy's var.

J. Gathorn Wood, Esq., Thedden Grange (gardener, Mr. N. Campany), sent flowers of a very large form of *Dendrobium nobile*.

Messrs. F. Ross & Co., Brewer Street, Bletchingley, showed a spike of the rare *Cymbidium Hookerianum*.

ORCHID COMMITTEE, MARCH 8, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and fifteen members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. F. Sander & Co., St. Albans, for a group of Orchids, among which were several different varieties of *Dendrobium Phalænopsis Schröderianum*, a fine lot of *Oncidium Phalænopsis*, *Masdevallia Gelengiana* ×, *Cypripedium Carrierei* ×, *C. Crossianum gemmatum* ×, *Spathoglottis aurea*, *Dendrobium Cassiope* × and a curious *Dendrobium*, inter-

mediate between *D. Farmeri* and *D. thyrsiflorum*, *Sobralia xantholeuca rubina*, *Odontoglossum Edwardii*, *O. triumphans* and *O. crispum* varieties, *Lælia harpophylla*, *L. cinnabarina*, *Masdevallia Estradæ* ♀ × *M. Shuttleworthii* ♂, *Angræcum sesquipedale* with eight flowers, *Phaius Cooksoni* ×, and various fine forms of *Dendrobium nobile*.

Silver Banksian Medal.

To Messrs. Pitcher & Manda, Hextable, Swanley, Kent, for a group of Orchids, consisting chiefly of rare varieties of *Cypripediums*, *Cattleya Trianæ*, *Cœlogyne cristata alba*, *Lycaste Skinnerii*, &c.

Award of Merit.

To *Odontoglossum Pescatorei*, Jackson's var. (votes, unanimous), from J. F. Jackson, Esq., Bourne Place, Bexley, Kent (gardener, Mr. George Dowsett). A variety prettily spotted with purple.

To *Cypripedium Ianthæ* × (*C. Harrisianum* ♀ × *C. venustum* ♂) (votes, 5 for, 4 against), from Messrs. James Veitch & Son, Chelsea.

To *Cypripedium Brysa* × (*C. Sedeni candidulum* ♀ × *C. reticulatum* ♂) (votes, unanimous), from Messrs. James Veitch & Son. This resembles a large form of the seed-bearing parent, but with a green tint in the flowers.

Botanical Certificate.

To *Dendrobium amethystoglossum* (votes, unanimous), from Messrs. Hugh Low & Co.

To *Oncidium chrysomorphum* (votes, unanimous), from W. L. Barclay, Esq., The Briars, Reigate (gardener, Mr. H. Bailey). A species much resembling *Odontoglossum Pescatorei* in growth, and with dense upright spikes of yellow flowers.

To *Disa incarnata* (votes, unanimous), from Messrs. Lewis & Co., Southgate. A beautiful species flowering for the first time under cultivation. The plant had three spikes. Flowers yellow and orange (fig. 21).

Cultural Commendation.

To F. W. Nixon, Esq., Edward Street, Leek, for a fine plant of *Odontoglossum maculatum* with four spikes.

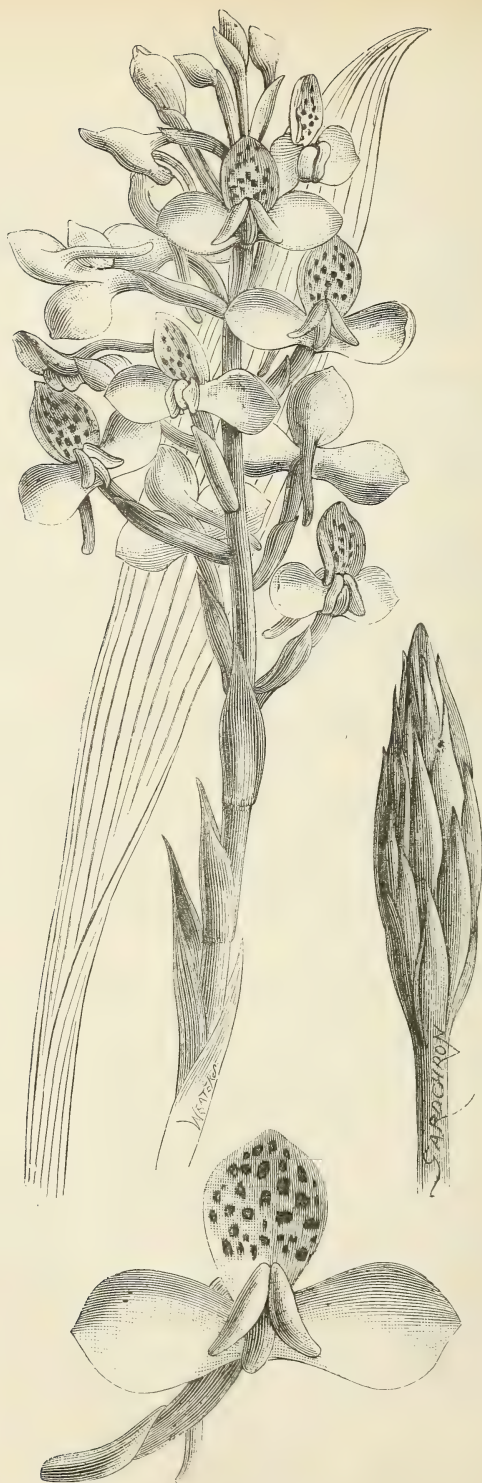


FIG. 21.—DISA INCARNATA. (From the *Gardeners' Chronicle*.)

Other Exhibits.

Messrs. James Veitch & Son exhibited *Cypripedium macrochilum* × (*C. longifolium* ♀ × *C. caudatum* Lindeni ♂), *Dendrobium Wardiano-japonicum* × (*D. japonicum* ♀ × *D. Wardianum* ♂), and *D. euosmum leucopterum* × (*D. nobile* ♀ × *D. endocharis* × ♂).

Messrs. B. S. Williams & Son, Upper Holloway, staged a fine specimen of *Phaius Cooksoni* × with two spikes, *Dendrobium chrysodiscus* ×, *Calanthe Williamsii*, and *Lycaste Skinnerii delicata*.

Messrs. Heath & Son, Cheltenham, sent *Cypripedium Swinburnei* × (*C. insigne* Maulei ♀ × *C. Argus* Moensii ♂).

W. R. Lee, Esq., Beech Lawn, Audenshaw, Manchester, exhibited a fine form of *Dendrobium nobile* and a good specimen of *D. Brymerianum*.

F. Wigan, Esq., Clare Lawn, East Sheen, showed a plant of *Odontoglossum Andersonianum* with but few spots on the segments of the flowers.

J. G. Wood, Esq., Thedden Grange, Alton, sent good flowers of *Dendrobium nobile*.

W. H. Evans, Esq., Forbe Abbey, Chard (gardener, Mr. John Crook), sent for name *Cymbidium eburneum*.

Cut flowers of a fine series of varieties of *Odontoglossum Rossii majus* were sent by Mr. J. W. Wilson, South Cave, East Yorks; a single spike of the same species with fifteen flowers was shown by Philip Crowley, Esq., Waddon House, Croydon, and cut flowers of many rare Orchids were brought by Reginald Young, Esq., Sefton Park, Liverpool.

ORCHID COMMITTEE, MARCH 22, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and seventeen members present.

Awards Recommended :—

Silver Banksian Medal.

To E. Miller Mundy, Esq., Shipley Hall, Derby (gardener, Mr. Wm. Elphinstone), for a group of different varieties of *Dendrobium Phalænopsis Schröderianum* ranging from white, tinged with lilac, to crimson.

To Messrs. F. Sander & Co., St. Albans, for a group of rare Orchids, comprising three varieties of *Phaius Cooksonii* ×, *Den-*

drobium Wardianum album, D. W. virginale, in which the chocolate spots seen on the lip of D. W. album are absent; the singular Epidendrum Laucheanum, with a long raceme of small



FIG. 22.—MOO REA IRRORATA (much reduced). (From the *Gardeners' Chronicle*.
brownish flowers with yellow lip; E. O'Brienianum \times with six
spikes. Batemannia Burtii, several Spathoglottis Lobbii, Cattleya

Trianae alba, *Phaius assamica*, *Ansellia lutea*, *Cypripedium Wallisii*, and many cut spikes of *Dendrobium Dalhousieanum*, *Epidendrum aurantiacum*, *Schomburgkia undulata*, and *Cattleya labiata*.

To Messrs. Charlesworth, Shuttleworth & Co., Heaton, Bradford, and Park Road, Clapham, for a group composed chiefly of *Oncidium Sarcodes*, *Odontoglossum cirrhosum*, *Lælia harpophylla*, &c.

First Class Certificate.

To *Dendrobium Phalænopsis Schröderianum* var. (votes, 11 for, 3 against), with large purplish-crimson flowers, from E.

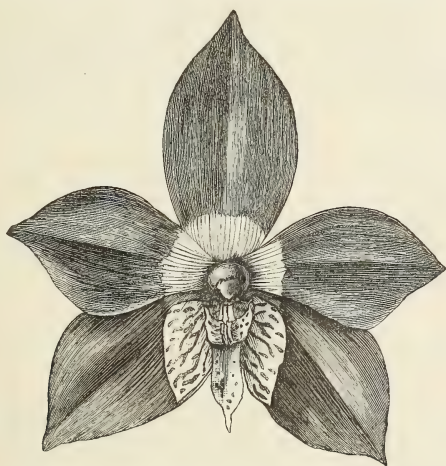


FIG. 23.—*MOOREA IRRORATA* (natural size). (From the *Gardeners' Chronicle*. Miller Mundy, Esq., Shipley Hall, Derby (gardener, Mr. Wm. Elphinstone).

To *Moorea irrorata* (votes, unanimous), from F. W. Moore, Esq., Curator, Royal Botanic Gardens, Glasnevin, Dublin. A new genus and species, somewhat resembling *Houlletia*, and with large flowers, white in the centre and with reddish-brown outer halves to the segments. The three-lobed lip is white and yellow with purple spots (figs. 22 and 23).

Award of Merit.

To *Dendrobium Phalænopsis Schröderianum delicatum* (votes, 7 for, 5 against), from E. Miller Mundy, Esq., Shipley Hall, Derby. Flowers white, tinged with lilac.

To *Dendrobium infundibulum*, Cassiobridge var. (votes, 7 for, 5 against), from Ed. Moon, Esq., Cassiobridge, Watford (gardener, Mr. Owen). In this the petals and front lobe of the lip are unusually large.

To *Odontoglossum platycheilum* (votes, unanimous), from R. I. Measures, Esq., Cambridge Lodge, Camberwell (gardener, Mr. H. Simpkins). A very singular plant, with the habit of *Odontoglossum nebulosum*, but smaller, and with flowers somewhat resembling those of *Oncidium Phalaenopsis*, and with the large pure white lip spotted with rose (fig. 24).

Botanical Certificate.

To *Megaclinium falcatum* (votes, unanimous), from F. W. Moore, Esq., Royal Botanic Gardens, Glasnevin, Dublin.

To *Epidendrum Laucheanum* (votes, unanimous), from Messrs. F. Sander & Co.

Other Exhibits.

Sir Trevor Lawrence, Bart., Burford Lodge, Dorking, exhibited *Dendrobium speciosum* ♀ × *D. Kingianum* ♂, a hybrid like a small *D. speciosum*.

G. R. Le Doux, Esq., Langton House, East Moulsey (gardener, Mr. Bowyer), sent *Odontoglossum triumphans* Le Doux var.

C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan), showed *Masdevallia simula*, *Dendrobium nobile nobilior*, and cut flowers of *D. n. nobilior*.

A. H. Smee, Esq., The Grange, Carshalton (gardener, Mr. G. W. Cummins), sent a fine spike of the crimson *Epidendrum Frederici-Guilielmi*.

R. I. Measures, Esq., Cambridge Lodge, Camberwell, staged *Brassia brachiata* and *Masdevallia Hinckiana* ×.

Messrs. Heath & Son, Cheltenham, sent flowers of *Cypripedium Argus Moensii*; and C. E. Smith, Esq., Silvermere, Cobham (gardener, Mr. Quarterman), sent for name flowers of *Lælia* (*Brassavola*) *glaucæ*, *Dendrobium hedyosmum*, and other Orchids.



FIG. 24.—*ODONTOGLOSSUM PLATYCHEILUM*.
(From the *Journal of Horticulture*.)

ORCHID COMMITTEE, APRIL 12, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and fourteen members present.

Awards Recommended :—

Silver Banksian Medal.

To Sir Trevor Lawrence, Bart. (grower, Mr. White), for a group of Orchids in which were the fine new *Cypripedium* Lawrebell \times , *C. Peetersianum* \times , *C. Clovenfords* \times (*C. superbiens* φ \times *C. lævigatum* σ), *C. Fraserii* \times , *Dendrobium cheltenhamense* \times (*D. luteolum* φ \times *D. heterocarpum* σ), *Bulbophyllum Sillemianum*, *Masdevallia Wendlandii* and *M. Moensii* \times (*M. xanthocorys* φ \times *M. Wagnerii* σ).

To C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. G. Duncan), for a group of Orchids comprising two fine examples of *Angræcum Sanderianum*, *A. articulatum*, *A. Leonis* with eighteen flowers, *Odontoglossum Cervantesii decorum* with over twenty flowers, *Pescatorea Klabochorum*, *Saccolabium ampullaceum*, *Miltonia Moreliana* var., *Cirrhopetalum picturatum* *Masdevallia chimæra*, &c.

To G. R. Le Doux, Esq., Langton House, East Moulsey (gardener, Mr. B. Bowyer), for a group of Orchids, in which were a fine example of *Miltonia Roezlii magnifica*, a bright golden yellow *Odontoglossum excellens*, some *O. triumphans*, *O. crispum*, *O. odoratum*, *O. mirandum*, a remarkably fine *O. Wilckeanum*, *Cattleya citrina*, and a curious greenish form of it named *C. c. virens*, and a well-flowered *Dendrobium primulinum*.

To H. J. Elwes, Esq., Colesborne Park, Gloucestershire (gardener, Mr. G. Hansford), for a grand specimen of *Vanda Denisoniana* with several heads and eight flower-spikes.

To Messrs. F. Sander & Co., St. Albans, for a group of rare Orchids, in which the new *Cypripedium Chamberlainianum* was a prominent feature. There were also a fine set of varieties of *Dendrobium Phalænopsis Schröderianum*, a large mass of *Oncidium ampliatus majus*, *Dendrobium Venus* \times , *Masdevallia Gelengiana* \times , *M. Courtauldiana* \times , *Odontoglossum Cervantesii roseum*, and many fine *Odontoglossum crispum*, *O. Pescatorei*, and varieties of *Masdevallia Harryana*.

To Messrs. B. S. Williams & Son, Upper Holloway, for a group of Orchids, in which were eight tall specimens of *Vanda tricolor* and *V. suavis*, some well-flowered *Dendrobium Findlay-*

anum, D. Wardianum, and other species ; *Cypripedium Morganæ* ×, *C. Schröderæ* ×, *Ada aurantiaca*, and *Cochlidia vulcanica grandiflora*.

First Class Certificate.

To *Cypripedium Chamberlainianum* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. A new and distinct species



FIG. 25.—*CYPRIPEDIUM CHAMBERLAINIANUM*. (From the *Journal of Horticulture*.)

from New Guinea, of great beauty. The dorsal sepal is greenish white with six chocolate lines, the petals of a similar colour with reddish-chocolate markings, and the lip white closely

spotted with rosy crimson. The flowers are produced several on a spike in wild specimens (fig. 25).

To *Cypripedium Lawrebell* \times (*C. Lawrenceanum* φ \times *C. bellatulum* σ) (votes, unanimous), from Sir Trevor Lawrence, Bart. This hybrid most resembles *C. Lawrenceanum*. The flowers are of a bright purplish crimson, with a tinge of green at the base of the upper sepal, on which there are dark purplish lines extending upwards to the pure white margin. The petals also have chocolate spots.

Award of Merit.

To *Lælio-Cattleya Marriottiana* \times (*Lælia flava* φ \times *C. Skinnerii* σ) (votes, unanimous), from Sir William Marriott, Down House, Blandford, Dorset. This is an extraordinary cross, the habit of the plant resembling a small *Schomburgkia tibicinis*. The flowers are yellowish pink tinged with brown in the younger flowers and buds.

To *Dendrobium Euryclea* \times (*D. lituiflorum* φ \times *D. Wardianum* σ) (votes, 6 for, 1 against), from Messrs. James Veitch & Son, and Charles Ingram, Esq., Elstead House, Godalming. This is the reverse cross to *D. micans* \times . Flowers white, tipped with rose, and with yellow and chocolate markings at the base of the lip.

To *Cypripedium Swinburnei* \times (*C. Argus Moensii* φ \times *C. insigne Maulei* σ), from Messrs. Heath & Son, Cheltenham. This resembles *C. expansum* \times , but has larger flowers with broader and more richly marked petals.

To *Odontoglossum Pescatorei Lindenæ* (votes, unanimous), from Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels. A fine variety with large irregular purple blotches on the sepals, petals, and lip.

Botanical Certificate.

To *Bulbophyllum* (*Sarcopodium*) *Sillemianum* (votes, unanimous), from Sir Trevor Lawrence, Bart. This species has yellow flowers and purple front lobe to the lip.

To *Masdevallia Wendlandii* (votes, unanimous), from Sir Trevor Lawrence, Bart. A species which requires to be grown in a warmer temperature than other *Masdevallias*.

Cultural Commendation.

To C. J. Lucas, Esq., Warnham Court, Horsham (gardener,

Mr. G. Duncan), for a fine plant of *Odontoglossum Cervantesii decorum* with over twenty flowers.

Other Exhibits.

Messrs. Hugh Low & Co., Clapton, staged a group of Orchids, in which *Cattleyas* were conspicuous ; *C. Mendelii albens*, a white form with pink tinge on the lip, was very beautiful. There were also good examples of *Odontoglossums*, *Cypripediums*, *Vandas*, *Saccolabium bellinum*, &c.

Messrs. Jas. Veitch & Son sent *Dendrobium atrovioleaceum*, *D. crassinodi-Wardianum* ×, raised in their nurseries and similar to the imported natural hybrid of the same parentage, and *D. Adrasta* × (*D. Pierardii* ♀ × *D. superbum* ♂).

Messrs. Linden, Brussels, exhibited *Odontoglossum Pescatorei maculatum*, *O. triumphans chrysantha*, *O. Cervantesii decorum*, *Cypripedium insigne siamense*, and *C. Van Molianum* × (*C. Spicerianum* ♀ × *C. hirsutissimum* ♂).

Mr. H. A. Tracy, Amyand Park Road, Twickenham, exhibited a fine specimen of *Cattleya Lawrenceana*.

Messrs. F. Ross & Co., Bletchingley, sent a large form of *Dendrobium Falconerii*.

Malcolm S. Cooke, Esq., Kingston Hill, showed a good *Dendrobium Wardianum*.

R. I. Measures, Esq., Cambridge Lodge, Camberwell, sent the new *Cypripedium Exul* (believed at first to be *C. insigne siamense*).

Baron Schröder, The Dell, Egham, exhibited cut spikes of some fine forms of spotted *Odontoglossum crispum*, the rare *O. Leeatum*, &c.

ORCHID COMMITTEE, APRIL 19, 1892.

JAS. DOUGLAS, Esq., in the Chair, and seven members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. F. Sander & Co. for a group of rare Orchids, comprising several new species, together with some fine varieties of *Dendrobium Phalænopsis Schröderianum*, *Cattleya Schröderæ* and several white *C. Schröderæ virginalis*, *Dendrobium Brymerianum*, *D. hercoglossum*, *D. Venus* ×, *Phaius Cooksonii*,

Spathoglottis Lobbi, *Cattleya intermedia punctatissima*, *C. gigas*, *C. labiata*, *C. speciosissima*, *C. Lawrenceana*, &c.

First Class Certificate.

To *Cattleya Burberryana* × (*C. intricata* ♀ × *C. superba* ♂) (votes, unanimous), from Messrs. F. Sander & Co. The flowers, which are 6 inches across, resemble those of *C. superba* in shape.

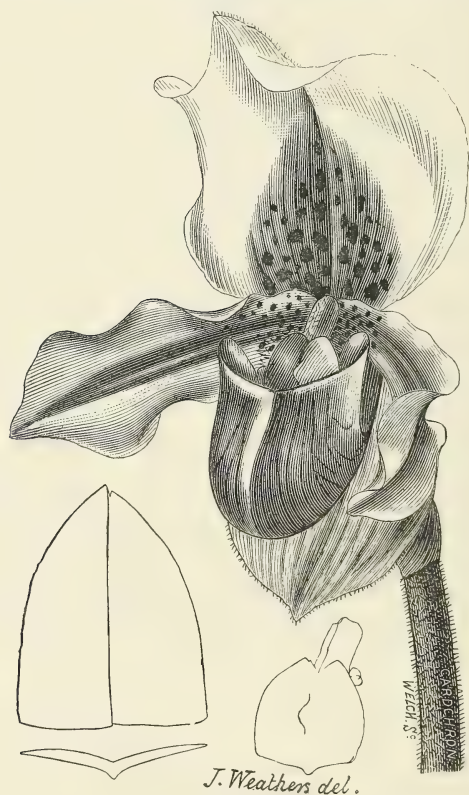


FIG. 26.—*CYPRIPEDIUM EXUL*. (From the *Gardeners' Chronicle*.)

Sepals and petals white tinged with pink; front of lip rich crimson.

Award of Merit.

To *Odontoglossum Wendlandianum* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. This appears to be a hybrid form of *O. blandum*. The sepals and petals are yellowish-

white spotted with brown, as in *O. crocidipterum*; lip pure white with crimson spots at the base.

To *Oncidium Gravesianum* (votes, unanimous), from Messrs. F. Sander & Co. This *Oncidium* was imported with *Cattleya labiata*. Its nearest affinity is *O. prætextum*. Flowers yellow and chestnut-brown; the edges of the sepals and petals vary as in *O. crispum*.

To *Cattleya Philo* \times (*C. Mossiæ* ♀ \times *C. iricolor* ♂) (votes, unanimous), from Messrs. Jas. Veitch & Sons. The flowers, which are about 4 inches across, have the sepals and petals blush white tinged with yellow. The front of the lip is crimson with a blush-white margin, the middle of the lip yellow; the base crimson with white veining.

To *Cypripedium Exul* (votes, unanimous), from R. I. Measures, Esq., Cambridge Lodge, Camberwell. This was exhibited at the last meeting as *C. insigne siamense*, under which name it had been first imported by Messrs. F. Sander & Co., but it was found to be a quite new species, of as near affinity to *C. Druryi* as to *C. insigne* (fig. 26).

Other Exhibits.

C. E. Smith, Esq., Silvermere, Cobham (gardener, Mr. J. Quarterman), exhibited a dwarf plant of *Dendrobium Wardianum* and several specimens of *Oncidium luridum*.

Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels, exhibited a plant and a full-size coloured drawing of their new *Cattleya Alexandræ*. It is in habit much like *Cattleya Leopoldii*, but the inflorescence, as seen on the plant exhibited, runs up 9 inches to 1 foot before bearing flowers.

ORCHID COMMITTEE, MAY 3, 1892.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair, and nine members present.

Awards Recommended :—

First Class Certificate.

To *Cattleya Victoria Regina* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. A very fine species with the

growth of *Cattleya Leopoldii* and flowers resembling those of *Lælia elegans Turnerii*.

To *Cattleya Mendelii*, Quorndon House var. (votes, unanims), from W. E. B. Farnham, Quorndon House, Loughborough (gaadener, Mr. G. Cook). The flowers of this fine variety, of which a very large specimen was exhibited, were white with a slight purple pencilling in the throat and a pale yellow stain on the base of the lip.

To *Lælio-Cattleya Phœbe* \times (*Cattleya Mossiæ* ♀ \times *Lælia cinnabarina* ♂) (votes, unanimous), from Norman C. Cookson, Esq., Oakwood, Wylam-on-Tyne (gardener, Mr. Murray). A remarkably pretty hybrid, the result of the reverse cross which produced *L.-C. Hippolyta* \times . The flowers are of a rich Indian yellow, with the middle lobe of the lip intense purplish crimson. The seed was sown in 1886.

To *Lælia Latona* \times (*L. cinnabarina* ♀ \times *L. purpurata* ♂) (votes, unanimous), from Messrs. Jas. Veitch & Sons, Chelsea. This pretty novelty had a slight resemblance to *L.-C. Phœbe* \times of Mr. Cookson, but the sepals and petals were of a lighter yellow, and folded back, as usually seen in *L. purpurata*.

Award of Merit.

To *Phaius Sanderianus* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. This much resembled a fine *P. Wallichii*, but the blush-white front of the labellum was abruptly turned down, and over an inch in length.

To *Cattleya Philo* \times var. *albiflora* (*C. Mossiæ* ♀ \times *C. iricolor* ♂) (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea. The white-petalled form of *C. Philo* \times exhibited at the last meeting.

Botanical Certificate.

To *Eriopsis biloba* (votes, unanimous), from Messrs. Charlesworth, Shuttleworth & Co., Heaton, Bradford, and Park Road, Clapham.

To *Cynorchis flexuosa* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. Flowers chrome-yellow, with a velvety brown blotch at the base of the lip.

Cultural Commendation.

To W. E. B. Farnham, Esq., Quorndon House, Loughborough (gardener, Mr. W. Cook), for a fine specimen of *Cattleya Mendelii*, Quorndon House var.

Other Exhibits.

Norman C. Cookson, Esq., Wylam-on-Tyne, exhibited a spike of *Cypripedium Rothschildianum* bearing fine large fully expanded flowers, and also an inflorescence of *Odontoglossum Andersonianum* var.

Messrs. Charlesworth, Shuttleworth & Co. showed *Lælia grandis tenebrosa* and *Stanhopea insignis*.

W. E. B. Farnham, Esq., Loughborough (gardener, Mr. W. Cook), staged a small group of fine forms of *Dendrobium Phalænopsis Schröderianum*.

The Rev. E. Handley, Royal Crescent, Bath, brought cut spikes of two very fine forms of white-petalled *Lælia purpurata* and of *Vanda teres*.

F. A. Gledstanes, Esq., Manor House, Gunnersbury (gardener, Mr. H. Denison), showed a fine spike of *Cyrtopodium punctatum* var.

E. G. Wrigley, Esq., Victoria House, Dukinfield (gardener, Mr. C. Harris), sent some plants of *Dendrobium Phalænopsis Schröderianum* and a dark form of *D. nobile*.

C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan), submitted for name *Epidendrum umbellatum*.

Messrs. B. S. Williams & Son, Upper Holloway, showed a pure white form of *Odontoglossum citrosmum*.

Walter C. Walker, Esq., Percy Lodge, Winchmore Hill (gardener, Mr. C. Cragg), sent *Lælia Boothiana* and a cut spike of *Gongora truncata*.

ORCHID COMMITTEE, MAY 17, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and eleven members present.

Awards Recommended :—

First Class Certificate.

To *Vanda teres alba* (votes, unanimous), from the Right Hon. Lord Rothschild, Tring Park, Tring (gardener, Mr. E. Hill). A pure white variety with a pale yellow stain on the labellum.

To *Cattleya iricolor* (votes, unanimous), from Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine). This pretty

little species has white flowers with a yellow and purple marking on the labellum.

Award of Merit.

To *Cattleya Skinnerii*, Temple's var. (votes, unanimous), from J. W. Temple, Esq., Leyswood, Groombridge (gardener, Mr. Bristow). A variety with larger and brighter coloured flowers than the type.

To *Cattleya Schröderæ leyswoodiensis* (votes, unanimous), from J. W. Temple, Esq., Leyswood, Groombridge. Flowers large, bright pinkish lilac; the labellum rich orange in the centre.

To *Cypripedium Evenor* \times (*C. Argus* φ \times *C. bellatulum* σ) (votes, unanimous), from Messrs. James Veitch & Sons, King's Road, Chelsea. The flowers of this fine hybrid resemble those of *C. Marshallianum* \times , but the foliage is nearer that of *C. Argus*.

To *Masdevallia caudato-Estradæ* \times (*M. Estradæ* φ \times *M. caudata Shuttleworthii* σ) (votes, unanimous), from Messrs. Jas. Veitch & Sons, Chelsea.

Botanical Certificate.

To *Sarcopodium (Bulbophyllum) Lobbii* var. (votes, unanimous), from C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan). This was a very large form of the species, and in colour much resembled *S. Dearei*, Reich. f.

Cultural Commendation.

To R. Brooman-White, Esq., Arddarroch, Garelochhead, N.B. gardener, Mr. Brown), for fine examples of cut *Cattleya Mendelii*, *C. Lawrenceana*, and one large form of *Odontoglossum crispum*.

Other Exhibits.

F. Wigan, Esq., Clare Lawn, East Sheen (grower, Mr. W. H. Young), exhibited *Dendrobium Lceanum atropurpureum*, which differed from the type in having the labellum wholly of a rich dark purple.

Reginald Young, Esq., Fringilla Linnet Lane, Sefton Park, Liverpool, sent cut flowers of two fine forms of *Lælia majalis* which had flowered with him four years in succession.

The Right Hon. Joseph Chamberlain, M.P., Highbury, Moor Green, Birmingham (grower, Mr. H. A. Burberry), sent cut spikes of two dissimilar forms of *Dendrobium superbiens*.

Messrs. James Veitch & Sons, Chelsea, exhibited a new hybrid *Cypripedium Eurylochus* \times (*C. ciliolare* ♀ \times *C. hirsutissimum* ♂), and a fine plant of *Dendrobium lineale* with five spikes.

J. W. Temple, Esq., Leyswood, Groombridge, exhibited *Cattleya Schröderæ rosea*.

The Rev. E. Handley, 19 Royal Crescent, Bath, sent a cut flower of a form of *Lælia præstans*.

ORCHID COMMITTEE, MAY 25, 1892.

INNER TEMPLE GARDENS.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and fourteen members present.

Awards Recommended:—

First Class Certificate.

To *Odontoglossum crispum* Sanderæ (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. A highly coloured form, with heavy crimson blotches on the sepals and petals.

To *Odontoglossum Lowryanum* (votes, unanimous), from Messrs. Sander & Co. The flowers were of a pale brown colour, and bore a resemblance to those of *O. triumphans* and *O. luteo-purpureum*, from which it may have arisen in a natural state.

To *Miltonia Bleui splendidissima* \times (*M. vexillaria* ♀ \times *M. Roezlii* ♂) (votes, unanimous), from Messrs. F. Sander & Co. A fine variety.

To *Phaius Sanderianus* (votes, unanimous), from Messrs. F. Sander & Co. This species received an "Award of Merit" at a previous meeting (May 3).

To *Cypripedium southgatense* \times (votes, unanimous), from Messrs. W. L. Lewis & Co., Southgate. A fine hybrid of the bellatulum section, with deep chocolate-purple blotches on a white ground.

To *Cypripedium Vipani* \times (*C. lævigatum* ♀ \times *C. niveum* ♂) (votes, unanimous), from Captain Vipan, Shippington Hall, Wansford. This is a beautiful hybrid. The leaves were slightly mottled, and the slender scape bore two white flowers, the upper

sepal and petals of which were striped with dark purple; the lip resembling that of *C. niveum*, being waxy-white with a few purple speckles (fig. 27).

Award of Merit.

To *Cattleya labiata Mendelii*, Cookson's var. (votes, unanimous), from Messrs. F. Sander & Co. A large form, with blush

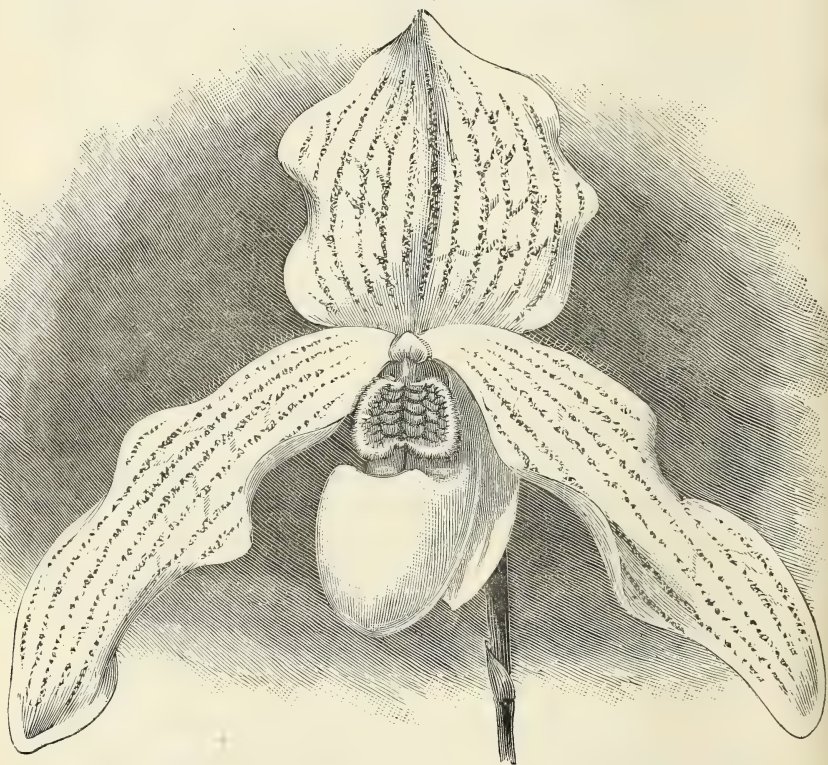


FIG. 27.—*CYPRIPEDIUM VIPANI*. (From the *Journal of Horticulture*.)

sepals and petals, and a deeply fringed lip resembling that of *C. Warscewiczii* (gigas).

To *Cypripedium Chamberlainianum excellens* (votes, unanimous), from Messrs. F. Sander & Co. A variety somewhat lighter in colour than the type.

To *Cymbidium Lowianum viride* (votes, unanimous), from Messrs. W. L. Lewis & Co. A variety remarkable for the absence of any markings on the labellum.

To *Lælia purpurata Handleyana* (votes, unanimous), from Mr. James Cypher, Cheltenham. The lip, which is of a deep wine-red purple, was the chief feature of this variety.

To *Odontoglossum Wilckeanum nobilior* (votes, unanimous), from Messrs. Charlesworth, Shuttleworth, & Co., Heaton, Bradford. A fine variety, with pale brown blotches on the segments.

Botanical Certificate.

To *Zygopetalum graminifolium* (votes, unanimous), from C. J. Lucas, Esq. (gardener, Mr. Duncan). A small species of grass-like growth, bearing purplish flowers.

To *Epidendrum Godseffianum* (votes, unanimous), from Messrs. F. Sander & Co. A robust species, with loose racemes of yellowish-brown flowers.

To *Oncidium Rolfeanum* (votes, unanimous), from Messrs. F. Sander & Co. A species closely related to *O. crispum*, but having smaller and somewhat lighter-coloured flowers.

Special Awards.

Silver Cup.

To Sir Trevor Lawrence, Bart. (grower, Mr. White), for a group of Orchids, containing a remarkable number of *Masdevallias*, some of the finest *Odontoglossums*, the best and rarest species and varieties of *Cypripedium*, besides numerous *Cattleyas*, *Dendrobiums*, *Aërides*, *Vandas*, &c.

To Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine), for a large collection, in which *Lælias*, *Cattleyas*, *Odontoglossums*, *Celogynes*, *Dendrobiums*, *Masdevallias*, *Cypripediums*, and several other genera from both hemispheres were represented.

To C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan), for a fine group, chiefly notable on account of the splendid varieties and sub-varieties of *Cattleya labiata* and *Lælia purpurata*, which were shown in great numbers, in addition to several *Dendrobiums*, *Masdevallias*, *Miltonias*, and *Odontoglossums*.

To Messrs. F. Sander & Co., St. Albans, for an extensive display of new and rare varieties of *Odontoglossum*, *Cypripedium*, *Dendrobium*, *Phalænopsis*, and many others, the most noteworthy of which were awarded certificates, as above.

To Messrs. Charlesworth, Shuttleworth & Co., Heaton, Bradford, for an excellent collection, in which *Oncidium macranthum* and other species, *Lælias*, *Cattleyas*, *Odontoglossums*, and *Cymbidium Lowianum* were special features.

To Mr. James Cypher, Cheltenham, for a group of well-grown Orchids, among which were some remarkable forms of *Cypripedium caudatum*, *Lælia purpurata*, *Dendrobium Devonianum*, *D. Bensoniæ*, *Oncidium sphacelatum*, *Epidendrum radicans*, &c.

Silver Gilt Flora Medal.

To the Right Hon. the Viscountess Portman, Buxted Park, Uckfield (gardener, Mr. H. C. Princep), for three plants of *Dendrobium nobile*, each specimen being about 6 feet through, and bearing flowers almost from top to bottom of the pseudo-bulbs, some of which were about 4 feet long. The pruning system had been adopted in the cultivation of these plants.

To F. Wigan, Esq., Clare Lawn, East Sheen (grower, Mr. W. H. Young), for a group principally consisting of fine specimens of *Lælia purpurata*, *Cattleya lab. Mendelii*, *Grammatophyllum multiflorum* with strong spikes, *Dendrobium suavisimum*, numerous *Cypripediums*, *Phalænopsis speciosa*, &c.

To Messrs. Hugh Low & Co., Upper Clapton, E., for a splendid group of *Cattleyas* and *Lælias*, *Dendrobium macranthum* in great profusion, several fine varieties of *Phalænopsis* and many robust *Odontoglossums*.

To Messrs. B. S. Williams & Son, Upper Holloway, for a large group made up of *Vandas tricolor* and *suavis*, *Cymbidium*s, the rare *Calanthe Masuca*, many *Odontoglossums*, *Dendrobium*s, *Lælias*, *Cypripediums*, &c.

To Messrs. Heath & Son, Cheltenham, for a good collection, in which were to be particularly noticed fine specimens of *Cypripedium Lawrenceanum*, *Cattleya intermedia*, *Cymbidium Lowianum*, &c.

To Messrs. W. L. Lewis & Co., Southgate, for a choice group of *Cypripediums*, *Oncidium macranthum*, *Cymbidium Lowianum viride*, &c.

Silver Flora Medal.

To F. C. Jacomb, Esq., Cheam Park, Surrey, for a good

group of such *Cattleyas* as *Mossiaë*, *Mendelii*, *Warscewiczii* (*gigas*); *Miltonias*, and *Dendrobium thysiflorum*.

Silver Banksian Medal.

To Baron Schröder, The Dell, Egham, for a remarkably fine specimen of *Cœlogyne Dayana*, with twelve spikes, some of which were between 3 and 4 feet long.

ORCHID COMMITTEE, JUNE 7, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and nine members present.

Awards Recommended :—

Silver Flora Medal.

To Walter Furze, Esq., Roselands, Teddington, for an effectively arranged group of Orchids, comprising good varieties of *Cattleya Mossiaë* and other *Cattleyas*, *Masdevallias*, *Cypripediums*, *Vandas*, &c.

Bronze Flora Medal.

To His Grace the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for a group of *Cypripedium barbatum*, *Miltonia vexillaria*, &c.

First Class Certificate.

To *Warscewiczella Lindenii* (votes, unanimous), from Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels. A fine pure white species with a few purple lines at the base of the lip (fig. 28).

Award of Merit.

To *Lælia grandis*, Warnham Court variety (votes, unanimous), from C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan). This is the finest dark form of *L. g. tenebrosa* which has yet been exhibited.

To *Cypripedium Alice* × (*C. Spicerianum* ♀ × *C. Stonei* ♂) (votes, unanimous), from Drewett O. Drewett, Esq., Riding-Mill-on-Tyne (gardener, Mr. A. J. Keeling). A fine hybrid, with the form of *C. Stonei*, but with the upper and lower sepals white, the upper one tinged with purple up the middle.

To *Odontoglossum crispum* Rex (votes, unanimous), from

Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine). A fine heavily spotted variety.

To *Odontoglossum crispum Wolstenholmæ* (votes, unanimous), from Baron Schröder. A very large light brown spotted variety.

Botanical Certificate.

To *Cymbidium Humblotii* (votes, unanimous), from C.



FIG. 28.—*WARSCIEWICZELLA LINDENI*. (From the *Journal of Horticulture*.)

Ingram, Esq., Godalming (gardener, Mr. Bond). This remarkable species, exhibited under the name *C. Loise-Chauvierii*, was referred to Kew for identification. It proved to be a new species from Madagascar, and was named by Mr. Rolfe after

M. Leon Humblot. (See *Gardeners' Chronicle*, July 2, 1892, p. 8.) Flowers pale green and black, somewhat resembling those of *Cœlogyne pandurata*.

To *Cyenoche peruviana* (votes, unanimous), from Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels.

To *Oncidium auriferum* (votes, unanimous), from Messrs. Linden, Brussels.

To *Coryanthes leucocorys* (votes, unanimous), from Messrs. Linden, Brussels.

To *Bulbophyllum elegans* (votes, unanimous), from Sir Trevor Lawrence, Bart., Burford Lodge, Dorking (grower, Mr. W. H. White).

Cultural Commendation.

To C. J. Lucas, Esq. (gardener, Mr. Duncan), for *Promenæa xanthina* with eighty flowers, and *Dendrobium McCarthiæ*.

Other Exhibits.

Sir Trevor Lawrence, Bart., exhibited *Masdevallia Shutteriana* × (*M. Shuttleworthii* ♀ × *M. Harryana* ♂), *Oncidium loxense*, *Dendrobium Parishii* *albens*, and *Odontoglossum Pescatorei* "Prince of Orange."

Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine), sent a fine cut spike of *Odontoglossum dellense* ×, certificated in April 1891.

The Rev. E. Handley, Royal Crescent, Bath (gardener, Mr. Kerslake), also sent a spike of a large white *Odontoglossum crispum*, curiously tinged with rose colour.

H. Shaw, Esq., Stamford House, Ashton-under-Lyne (gardener, Mr. J. Cliffe), sent *Cattleya Mendelii* *Shawiana*, a nearly white variety, with yellow base to the labellum.

Drewett O. Drewett, Esq., Riding-Mill-on-Tyne, sent cut flowers of *Masdevallia falcata* × (*M. Veitchii* ♀ × *M. Lindenii* ♂), with flowers of the parents named, and also *M. Chelsoni* × for comparison.

F. Wigan, Esq., Clare Lawn, East Sheen (grower, Mr. W. H. Young), staged *Cattleya Mendelii*, *Clare Lawn* var., *Odontoglossum citrosimum roseum*, and *Cypripedium Rothschildianum*.

The Right Hon. Joseph Chamberlain, M.P., Birmingham (grower, Mr. H. A. Burberry), sent fine cut examples of *Cattleya Mossiæ*.

From R. B. Cater, Esq., Westfield House, Bath (gardener, Mr. W. Jansen), came a few good specimens of *Cattleyas*.

Mr. Bridger, The Gardens, Penshurst Place, showed *Platyclinis latifolia*.

Messrs. de Rothschild, Gunnersbury House, Acton (gardener, Mr. James Hudson), sent a dozen spikes of *Lælia purpurata*.

Messrs. F. Sander & Co., St. Albans, again exhibited the fine *Lælio-Cattleya Arnoldiana*, also *Cattleya Forbesii*, Sander's variety.

J. W. Temple, Esq., Leyswood, Groombridge (gardener, Mr. E. Bristow), exhibited some good varieties of *Cattleya Mendelii* and *C. labiata* Warnerii.

Messrs. Hugh Low & Co., Clapton, sent some good examples of *Cattleya Mossiæ*.

Sir Charles Strickland, Bart., Hildenley, Malton, Yorks, forwarded a fine coloured photograph of a bank of *Cattleya citrina*, as grown at Hildenley.

Prizes.

Class 2.—Twelve Orchids, cut trusses, distinct. Amateurs. *First Prize*, Silver Gilt Flora Medal and £1. 10s., to His Grace the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for a very fine exhibit.

Class 4.—For the best Seedling Orchid. Open. Silver Gilt Flora Medal, to Messrs. F. Sander & Co., St. Albans, for *Lælio-Cattleya Arnoldiana* ×, the same as last year. C. Ingram, Esq., Elstead House, Godalming (gardener, Mr. T. W. Bond), came second with the form of *Lælio-Cattleya Canhamiæ* raised at Elstead House.

ORCHID COMMITTEE, JUNE 21, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and eleven members present.

Awards Recommended:—

Silver Flora Medal.

To Messrs. F. Sander & Co., St. Albans, for a group of rare Orchids, among which were the white *Cattleya Amesiae*, *C. princeps*, *Thunia Brymeriana*, *T. Campbelliæ*, *Angræcum*

O'Brienianum, Lælio-Cattleya Arnoldiana \times , Dendrochilum filiforme with thirty spikes, &c.

Silver Banksian Medal.

To Messrs. Collins & Collins, Willesden Park, Willesden, for an effectively arranged group of well-known showy Orchids—Dendrobiums, Cattleyas, Odontoglossums, &c.

First Class Certificate.

To Cattleya Empress Frederick \times (C. Mossiæ φ \times C. Dowiana σ) (votes, unanimous), from Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine). A remarkably fine hybrid of Veitchian origin, with nearly white sepals and petals, and large rich purplish-crimson lip.

To Sobralia Lucasiana (votes, unanimous), from C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan). Flowers and plant resembling Sobralia xantholeuca. Sepals and petals white, tinged with lilac, the front of the lip also being rosy lilac.

Award of Merit.

To Cattleya Amesiae (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. A fine white-flowered Cattleya imported from the district lying between those in which C. Mendelii on the one side and C. Percivaliana on the other are found.

To Cattleya princeps (votes, unanimous), from Messrs. F. Sander & Co. This resembles a fine form of C. Schofieldiana, but almost the entire surface of the petals is covered with dark purplish crimson.

To Dendrobium Souvenir d'Alec (votes, unanimous), from Hamar Bass, Esq., Burton-on-Trent. The plant resembled Dendrobium transparens, but the flowers were entirely pure white.

To Cattleya labiata marmorata (votes, unanimous), from J. T. Gabriel, Esq., Palace Road, Streatham Hill. The petals were striped with crimson, after the manner of C. Trianae Mas-sangeana.

To Oncidium Lanceanum, Woodall's var. (votes, 4 for, 2 against), from E. H. Woodall, Esq., St. Nicholas House, Scarborough (gardener, Mr. Hughes). A large and highly coloured variety with dark rose lip.

To Grammatophyllum Seegerianum (votes, unanimous), from C. J. Lucas, Esq., Warnham Court, Horsham.

To *Lælia purpurata*, The Dell variety (votes, unanimous), from Baron Schröder. A dark variety with a bronzy hue over the whole flower.

To *Cypripedium Telemachus* \times (*C. niveum* ♀ \times *C. Lawrenceanum* ♂) (votes, unanimous), from Messrs. Jas. Veitch & Sons. This is the same cross as that which produced *C. Aphrodite* \times , but in this the flowers have a darker shade of purplish crimson over the whole surface, and other differences.

Other Exhibits.

Baron Schröder exhibited fine spikes of *Lælio-Cattleya eximea* \times (*C. Warnerii* ♀ \times *C. purpurata* ♂), *Lælio-Cattleya Canhamiæ* \times (*C. Mossiæ* ♀ \times *C. purpurata* ♂), and *Cattleya Gaskelliana alba*.

G. R. Le Doux, Esq., Langton House, East Moulsey (gardener, Mr. Bowyer), sent an eight-flowered specimen of the light-coloured *Cattleya Mossiæ* "Mrs. Le Doux," and a plant of a *Cattleya Mossiæ* bearing much resemblance to *C. Percivaliana*.

H. F. Tiarks, Esq., Foxbury, Chislehurst (gardener, Mr. J. Lyne), sent a light-coloured form of *Lælia grandis*.

J. Gurney Fowler, Esq., Glebelands, Woodford (gardener, Mr. J. Davis), exhibited *Cattleya Mossiæ Reineckiana*.

Reginald Young, Esq., Fringilla, Sefton Park, Liverpool (gardener, Mr. Poyntz), showed *Odontoglossum Poyntzianum*, a natural hybrid having the form of *O. Andersonianum*, but with the cinnamon-coloured marking of *O. Schillerianum*.

The Right Hon. Joseph Chamberlain, M.P., sent cut spikes of *Cattleya Mossiæ*, *C. M. Wagnerii*, and *C. Walkeriana*.

R. Brooman-White, Esq., Arddarroch, Garelochhead, Dumbartonshire, sent cut examples of *Cattleya Mendelii* and *C. grandis tenebrosa*, cut from a plant bearing twenty-six flowers.

Sir William Marriott, Bart., Down House, Blandford, also sent good cut spikes of *Cattleya Warscewiczii* (gigas).

ORCHID COMMITTEE, JULY 12, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and twelve members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. F. Sander & Co., St. Albans, for a group of rare

Orchids, in which a fine form of *Miltonia vexillaria*, with a very dark maroon blotch at the base of the lip, and a pure white variety were prominent. Other noteworthy things were *Cattleya Batalinii*, a slender-stemmed supposed natural hybrid, *Oncidium Enderianum* (*O. crispum* \times *O. curtum* ?), and the rare scarlet and orange *Renanthera matutina*.

To Messrs. Charlesworth, Shuttleworth & Co., of Heaton, Bradford, and Park Road, Clapham, for a group of *Oncidium*s, composed chiefly of *Oncidium macranthum* and *O. curtum*.

First Class Certificate.

To *Calopogon pulchellus* (votes, 10 for), from Mr. T. S. Ware, Tottenham. A very pretty and almost hardy Orchid, with mauve-coloured flowers (fig. 29).

Award of Merit.

To *Dendrobium crystallinum*, General Berkeley's var. (votes, unanimous), from Major-Gen. E. S. Berkeley, Bitterne, Southampton. A fine form, in which the segments are heavily tipped with crimson.

To *Phalænopsis Artemis* \times (*P. amabilis* Bl. φ \times *P. rosea* σ) (votes, unanimous), from Messrs. James Veitch & Sons, Chelsea. This is a very pretty hybrid of the *P. intermedia* class.

To *Cypripedium Stonei candidum* (votes, 4 for, 3 against), from Messrs. Pitcher & Manda, Hextable, Swanley. A curious variety, with almost wholly ivory-white flowers.

Botanical Certificate.

To *Epidendrum tampense*, from C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan).

Cultural Commendation.

To W. Vanner, Esq., Camden Wood, Chislehurst (gardener, Mr. W. H. Robbins), for a superb plant of *Cœlogyne Sanderiana* with three spikes, bearing altogether thirty flowers.

Other Exhibits.

J. T. Gabriel, Esq., Palace Road, Streatham (gardener, Mr. E. Ranson), also exhibited *Cœlogyne Sanderiana*.

J. W. Temple, Esq., Leyswood, Groombridge (gardener, Mr. E. Bristow), exhibited *Cattleya granulosa* Dubuyssoni, *C. labiata* Mendelii and *C. l. Warscewiczii* vars., and *Cypripedium philippinense*.

Messrs. Lewis & Co., Southgate, sent a new hybrid *Cypripedium* (*C. Lowii* ♀ × *C. Lawrenceanum* ♂) of very distinct character.



FIG. 29. — CALOPOGON PULCHELLUS. (From the *Journal of Horticulture*.)

Messrs. Hugh Low & Co., Clapton, staged a small group of Orchids, in which were examples of *Cypripedium bellatulum*, *C. Volonteanum* and the light-coloured variety *C. V. Lowii*, *C. hirsutissimum*, *Zygopetalum (Pescatorea) cerinum*, *Cattleya lab. Gaskelliana alba*, &c.

Mrs. Crawford, Gattens, Reigate (gardener, Mr. Slogrove), sent a fine form of *Cattleya lab. Warscewiczii*.

ORCHID COMMITTEE, JULY 26, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and twelve members present.

Award Recommended:—

First Class Certificate.

To *Cattleya Schilleriana Lowii* (votes, unanimous), from Messrs. Hugh Low & Co., Clapton. An extraordinary form, in which the labellum was white, closely veined with dark lavender-blue, and much resembling the same organ in one of the lesser forms of *Zygopetalum Mackaii* (fig. 30).

To *Cattleya Rex* (votes, 7 for, 1 against), from Welbore Ellis, Esq., Hazlewood, Dorking, and H. M. Pollett, Esq., Fernside, Bickley. A distinct species, with yellowish sepals and petals and trumpet-shaped fringed lip, crimson netted with yellow.

Award of Merit.

To *Cypripedium Bryan* × (*C. philippinense* ♀ × *C. Argus* ♂) (votes, unanimous), from Norman C. Cookson, Esq., Oakwood, Wylam-on-Tyne (gardener, Mr. William Murray). This is a very distinct variety, differing materially from *C. burfordiense*, which is said to be from the same parentage. Petals broad, deflected, heavily spotted with blackish brown. The upper sepal white, greenish at the base, and with fine purple lines ascending therefrom. Lip greenish white, tinged with pale rose.

To *Cypripedium Youngianum superbum* × (*C. superbiens* ♀ × *C. philippinense* ♂) (votes, unanimous), from Norman C. Cookson, Esq. This is an improvement on *C. Morganæ* or the original *C. Youngianum*.

Botanical Certificate.

To *Sobralia Lowii* (votes, unanimous), from Messrs. Hugh Low & Co. A small-growing species with crimson flowers.

To *Cœlogyne peltastes* (votes, unanimous), from G. R. Le Doux, Esq., Langton House, East Moulsey (gardener, Mr. B. Bowyer).

Cultural Commendation.

To F. Wigan, Esq., Clare Lawn, East Sheen (grower, Mr. W. H. Young), for a fine plant of *Platyclinis filiformis* with about seventy spikes.



FIG. 30.—*CATTELEYA SCHILLERIANA* LOWII. (From the *Journal of Horticulture*.)

Other Exhibits.

Messrs. F. Sander & Co., St. Albans, exhibited *Cattleya Gaskelliana alba*, *C. Schofieldiana hella*, *Odontoglossum Schröderianum*, *Cynorchis triphylla*, and several varieties of *Cypripediums*.

Messrs. Hugh Low & Co., Clapton, sent *Aërides I'Ansonii*, *Lælia amanda*, *Cypripedium De Witt Smith* ×, *C. ænanthum* ×, and *Miltonia Moreliana atrorubens*.

F. Wigan, Esq., Clare Lawn, East Sheen, staged *Dendrobium Leeatum atropurpureum*, and spikes of *Stauroopsis lissochiloides* (*Vanda Batemanni*), and *Lælia elegans* var.

From the Marquis of Salisbury's gardens, Hatfield, Mr. G. Norman brought six fine cut spikes of *Rhyncostylis guttata*.

Charles Winn, Esq., The Uplands, Selly Hill, Birmingham, sent *Cypripedium Edith Winn* × (*C. Stonei* ♀ × *C. purpuratum* ♂), a variety of great promise, which the Committee desired to see again.

C. Ingram, Esq., Elstead House, Godalming (gardener, Mr. T. W. Bond), exhibited *Cypripedium Hecla* × (*C. superbiens* ♀ × *C. Swanianum* ♂), *C. The Gem* × (*C. marmorophyllum* ♀ × *C. insigne Chantinii* ♂), and *C. Bijou* × (*C. ænanthum* ♀ × *C. Lawrenceanum* ♂).

Norman C. Cookson, Esq., showed *Cypripedium Tautzianum* × (*C. barbatum* ♀ × *C. niveum* ♂).

C. J. Lucas, Esq., Warnham Court, Horsham, sent a fine plant of the curious *Eria vestita*, and a cut spike of a very good *Cattleya Warscewiczii*.

G. R. Le Doux, Esq., Langton House, East Moulsey (gardener, Mr. B. Bowyer), staged *Oncidium trulliferum* and several *Cattleyas*.

Mr. P. McArthur, London Nursery, Maida Vale, sent *Cypripedium superbiens* and *C. Godefroyæ*.

Messrs. Pitcher & Manda, Hextable, Swanley, Kent, exhibited a small group, in which were *Cypripedium Stonei candidum* and other species and varieties, and *Saccolabium cœleste*; and J. F. Alcock, Esq., Northchurch, Berkhamstead (gardener, Mr. Wade), sent a plant of *Mormodes citrinum*.

ORCHID COMMITTEE, AUGUST 9, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and eight members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. F. Sander & Co., St. Albans, for a group of Orchids, comprising *Cypripedium Wallisii*, *C. Doris* ×, *C. doliare* ×, and others; *Saccolabium Hendersonianum*, the fine new

Calanthe Sanderiana, *Vanda Sanderiana*, *Bulbophyllum mandibulare*; some fine *Cattleya granulosa Schofieldiana* and other species; *Odontoglossum Schröderianum*, *Oncidium tigrinum*, and a new hybrid, *Lælia Oweniana* \times (*L. pumila* Dayana ♀ \times *L. xanthina* ♂).

First Class Certificate.

To *Lælio-Cattleya Ingrami* \times (*L. pumila* Dayana ♀ \times *Cattleya Dowiana aurea* ♂) (votes, unanimous), from C. L. N. Ingram,

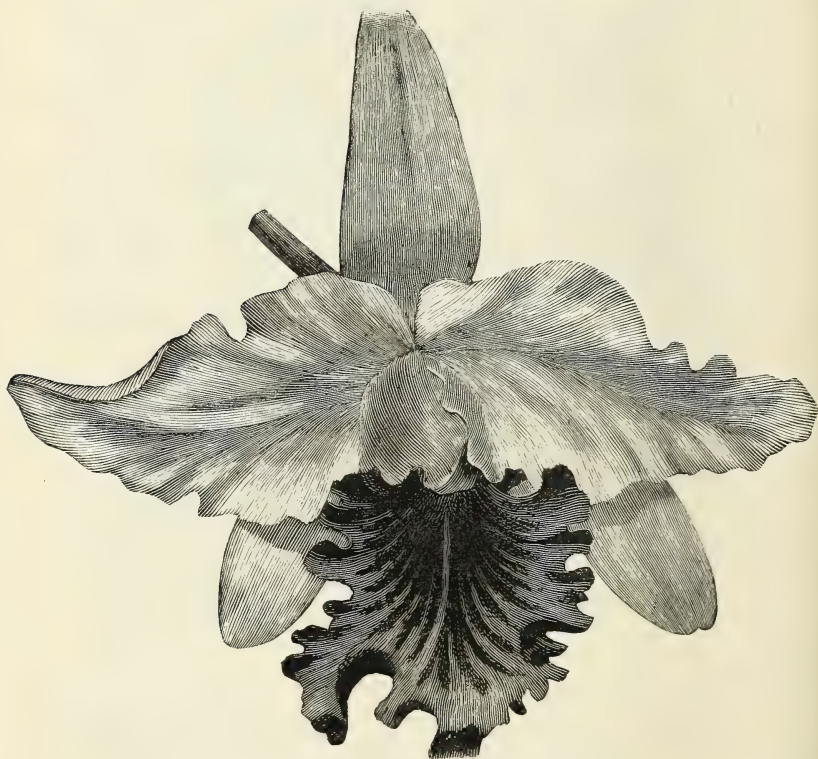


FIG. 31.—*LÆLIO-CATTELEYA INGRAMI*. (From the *Journal of Horticulture*.)

Esq., Elstead House, Godalming (gardener, Mr. T. W. Bond). A very pretty dwarf hybrid, with the sepals and petals light rose; lip purplish crimson, with an obscure tracing of a lighter hue, the form of the lip being very suggestive of *C. aurea* (fig. 31).

To *Cypripedium caudatum*, Luxembourg var. (votes, unani-

mous), from M. Godefroy-Lebeuf, Paris. This is said to be the typical *C. caudatum*, the plants generally found under that name in gardens being *C. c. roseum*. The Luxembourg var. is erect-growing and much stronger than the variety *roseum*.

Award of Merit.

To *Calanthe Sanderiana* (votes, unanimous), from Messrs. F. Sander & Co. This seems to be the largest of the *C. Masuca* type. The flowers are of deep rose colour, with a large and flat rich purple labellum.

To *Lælia crispa superba* (votes, unanimous), from Thos. Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr. R. Johnson). A fine variety, in which the shorter, broader, and more richly coloured front lobe of the lip are the distinguishing features.

To *Oncidium macranthum nanum* (votes, unanimous), from Messrs. Charlesworth, Shuttleworth & Co., Heaton, Bradford. The plants exhibited on this, as on former occasions, had fine flowers, on spikes often not more than a foot high.

To *Lælia Oweniana* × (*L. pumila* Dayana ♀ × *L. xanthina* ♂) (votes, unanimous), from Messrs. F. Sander & Co. Flowers the size of *L. pumila* Dayana; sepals and petals white; lip purplish crimson, with a white blotch at the tip and yellow tinge in the tube.

Other Exhibits.

A. H. Smee, Esq., The Grange, Hackbridge (gardener, Mr. G. W. Cummins), sent a spike of *Phaius Humblotii* Henryii.

F. Wigan, Esq., Clare Lawn, East Sheen (gardener, Mr. Young), exhibited *Angræcum caudatum* and *Lycaste tetragona*.

I. M. Burton, Esq., Gainsborough, forwarded a hybrid *Cypripedium*, which was identified as *C. Maynardi* ×.

Messrs. Jas. Veitch & Sons sent *Cypripedium Astrea* × (*C. Spicerianum* ♀ × *C. philippinense* ♂). The flowers had the dorsal sepal white, green at the base, and with a purple median line; petals tinged with purple, twisted; lip greenish white, tinged dull rose.

Mr. McArthur, Maida Vale, sent a form of *Cypripedium Godefroyæ* very nearly approaching *C. bellatulum*.

Messrs. Hugh Low & Co. also sent a form of *C. Godefroyæ*

with very pale yellow flowers, and four fine plants of *Vanda cœrulea*, *Trichopilia rostrata*, and *Angræcum articulatum*.

Messrs. Charlesworth, Shuttleworth & Co. exhibited *Bifrenaria Charlesworthii* (provisionally named); flowers like *B. tetragona*, but differing materially in the form of the lip; also *Anguloa Turneri*, *Zygopetalum Wailesianum*, and *Miltonia Moreliana atrobubens*.

Thos. Statter, Esq., Stand Hall, Manchester, exhibited *Lælia elegans Bluntii*, and a cut spike of *Lælio-Cattleya Amesiana* ×.

C. L. N. Ingram, Esq., Godalming, sent *Cypripedium Elsteadianum* × (*C. conchiferum* ♀ × *C. grande* ♂).

ORCHID COMMITTEE, AUGUST 23, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and four members present.

Awards Recommended:—

First Class Certificate.

To *Cattleya Baroness Schröder* × (*C. labiata Trianæ* ♀ × *Lælia Jongheana* ♂) (votes, unanimous), from Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine). The plant, which was but a few inches in height, bore a flower much resembling that of a small *Cattleya Schröderæ*. Sepals and petals veined and tinged with clear rose-pink; lip white, pink at the edge, and with an orange-coloured throat.

Other Exhibits.

Drewett O. Drewett Esq., Riding-Mill-on-Tyne, Northumberland (gardener, Mr. A. J. Keeling), sent a cut spike and leaf of a light form of *Cypripedium De Witt Smith* ×.

Messrs. Pitcher & Manda, Hextable, Swanley, Kent, sent *Cypripedium magniflorum*, apparently a form of *C. longifolium*, and *C. Wallaertii pallidum* × (*C. Harrisianum* ♀ × *C. villosum* ♂).

Messrs. F. Sander & Co., St. Albans, again exhibited *Calanthe Sanderiana*; and C. Whitfield King, Esq., Morpeth House, Ipswich, sent for name a Madagascar Orchid, which proved to be *Eulophia macrostachya*.

ORCHID COMMITTEE, SEPTEMBER 6, 1892.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair, and nine members present.

Awards Recommended :—*Silver Gilt Medal.*

To Messrs. F. Sander & Co., St. Albans, for a remarkably fine group of Orchids, in which the large specimens of *Vanda Sanderiana* were of great merit. In the aggregate they bore 124 blooms.

Silver Flora Medal.

To W. E. B. Farnham, Esq., Quorndon House, Loughborough (gardener, Mr. Cooke), for a showy group made up of 36 varieties of *Dendrobium Phalænopsis Schröderianum* and a lot of good *D. formosum giganteum*.

Silver Banksian Medal.

To Messrs. Pitcher & Manda, Hextable, Swanley, Kent, for a group of Orchids, chiefly of rare *Cypripediums*, with which were a number of plants of *Oncidium incurvum*, &c.

First Class Certificate.

To *Cattleya speciosissima Sanderiana* (votes, unanimous), from W. R. Lee, Esq., Beech Lawn, Audenshaw, Manchester. A splendid pure white variety, with only a slight pale yellow tinge in the tube of the labellum.

To *Cattleya Oweniana* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. A supposed natural hybrid of the *C. aurea* class, with cream-coloured sepals and petals and rich crimson lip veined with yellow, and much resembling in that respect *C. Hardyana*.

To *Sophro-Cattleya Veitchii* × (*Sophronitis grandiflora* ♀ × *Lælio-Cattleya elegans* [*Schilleriana*] ♂) (votes, unanimous), from Messrs. Jas. Veitch & Sons, Chelsea. A remarkable hybrid, producing from a plant only a few inches in height showy flowers with the sepals and petals clear rosy-red, with an orange tinge, the veining being of a darker hue; lip yellow at the base, with crimson veining and tip to the front lobe.

Award of Merit.

To *Lælia elegans superbissima* (votes, unanimous), from Thos. Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr.

Johnson). A very handsome form of the "Turneri" section, with very large and richly coloured labellum.

To *Aërides Augustianum* (votes, unanimous), from Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels. A very distinct and elegant species, with large racemes of pink flowers.

Cultural Commendation.

To Sir Trevor Lawrence, Bart., Burford Lodge, Dorking (grower, Mr. W. H. White), for a fine basket of *Habenaria militaris*.

To the Rev. E. Handley, Bath (gardener, Mr. Kerslake), for *Dendrobium Phalænopsis Schröderianum* with 23 flowers on a spike, and *D. Statterianum* with six spikes.

Other Exhibits.

Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels, exhibited three fine forms of *Cattleya Aclandiae*, and cut spikes of *C. guttata Leopoldii* and varieties.

Baron Schröder sent a fine spike of the yellow *Phaius maculato-grandifolius* ×.

Messrs. Hugh Low & Co., Clapton, sent plants of *Vanda Kimballiana* and *Cypripedium Parishii*.

Mr. McArthur, Maida Vale, staged a small group of Orchids.

Stanley G. Lutwyche, Esq., Oakfield, Eden Park, Beckenham, sent a large plant of *Peristeria elata* with one spike.

John Larkin, Esq., Delrow, Watford, showed a hybrid *Cypripedium*, which the Committee identified as *T. B. Haywood* × (*C. Druryi* ♀ × *C. Spicerianum* ♂).

Thos. Statter, Esq., sent cut spikes of *Cattleya Amesiana* × and an unspotted *C. granulosa*.

Sir Trevor Lawrence, Bart., exhibited a fine specimen of *Miltonia spectabilis Moreliana*.

ORCHID COMMITTEE, SEPTEMBER 20, 1892.

DR. MAXWELL T. MASTERS, F.R.S., in the Chair, and eleven members present.

Awards Recommended :—

First Class Certificate.

To *Cattleya Statteriana* (votes, unanimous), from Thos.

Statter, Esq., Stand Hall, Whitefield, near Manchester (gardener, Mr. R. Johnson). This beautiful novelty may be likened to a *C. Hardyana* with cream-white sepals and petals. The crimson in the lip is lighter than in *C. Hardyana*.

Award of Merit.

To *Cattleya Minucia* \times (*C. Loddigesii* ♀ \times *C. labiata* ♂), (votes, unanimous), from Messrs. Veitch & Sons, Chelsea. The plant exhibited was small, and bore a flower about half the size of a *C. labiata*, but with evidence of the seed-bearing parent in the labellum.

Other Exhibits.

J. Foster Alcock, Esq., Northchurch, Berkhamstead, exhibited a plant of *Catasetum pileatum* (*Bungerothii*) with seven male flowers and one female flower on the spike.

Thos. Statter, Esq., Stand Hall, Whitefield, near Manchester, (gardener, Mr. R. Johnson), showed *Cattleya aurea* Statteriana, previously awarded a First-class Certificate. It is almost entirely golden yellow, there being only a few purple markings in the labellum.

Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels, sent *Cyrtopodium Aliciæ*, and a yellow species, which, not being sufficiently advanced, the Committee requested to see again. The same firm also sent the true *Odontoglossum præstans*.

Messrs. F. Sander & Co., St. Albans, staged a small group, comprising many rare *Cypripediums*, *Dendrobium Phalænopsis*, *Schröderianum*, *Vanda cærulea*, &c.

Chas. L. N. Ingram, Esq., Elstead House, Godalming (gardener, Mr. T. W. Bond), showed a hybrid *Cypripedium* of the *Harrisianum* class.

Messrs. B. S. Williams & Son, Upper Holloway, exhibited *Oncidium incurvum album*, which received a First-class Certificate in 1884.

Geo. Hardy, Esq., Pickering Lodge, Timperley (gardener, Mr. W. Holmes), sent a spike of the true *Vanda insignis*.

W. Walker, Esq., Brettargh Holt, Kendal, exhibited two fine specimens of *Saccolabium Blumei*, each with twelve spikes.

Messrs. Hugh Low & Co., Clapton, staged a small group of *Vanda Kimballiana*, *Dendrobium formosum giganteum*, *Cattleyas*, &c.

ORCHID COMMITTEE, OCTOBER 4, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and seven members present.

Awards Recommended :—

Silver Flora Medal.

To Messrs. B. S. Williams & Son, Upper Holloway, N., for a group of Orchids, including many rare *Cypripediums*, *Miltonia candida grandiflora* with over fifty flowers, *Oncidium incurvum album*, &c.

Silver Banksian Medal.

To Messrs. F. Sander & Co., St. Albans, for a group of rare Orchids, among which were two fine varieties of *Houlletia Brocklehurstiana*, a beautiful pan of *Phalænopsis Lowii*, *Grobya Amherstiae*, *Sarcanthus teretifolius*, and other curious species.

To Messrs. Hugh Low & Co., Clapton, for a group of Orchids, in which were many *Vanda Kimballiana*, *V. cærulea*, and several *Cattleyas*.

Cultural Commendation.

To Wilberforce Bryant, Esq., Stoke Park, Slough (gardener, Mr. David Kemp), for a specimen of *Oncidium ornithorhynchum* with forty-five spikes.

Other Exhibits.

Thos. Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr. R. Johnson), exhibited an almost spotless form of *Cattleya granulosa*, a small form of *Cattleya bicolor* with a slate-blue lip, and a cut spike of a good form of *Lælia elegans*.

Messrs. Pitcher & Manda, Hextable, Swanley, Kent, staged a group of *Cypripediums*, &c.

W. C. Clark, Esq., Orleans House, Aigburth Drive, Liverpool, sent a large coloured crayon drawing of a magnificent plant of a light-coloured form of *Cattleya Hardyana* with ten flowers which bloomed in the collection of Reginald Young, Esq., Fringilla Sefton Park, Liverpool.

C. K. Wild, Esq., Hampstead Heath (gardener, Mr. R. Pallant), exhibited *Stanhopea Wardii aurea*.

W. Wells, Esq., Broomfield, Sale, Manchester, sent a flower of *Cattleya aurea marmorata*, which had previously been exhibited from Lord Rothschild's collection.

ORCHID COMMITTEE, OCTOBER 18, 1892.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair, and eight members present.

Awards Recommended :—*Silver Banksian Medal.*

To Messrs. B. S. Williams & Son, Upper Holloway, N., for a good group of Orchids, in which were fine specimens of about twenty species and varieties of *Cypripedium*, some fine *Odontoglossums* and *Dendrobiums*, and *Bollea Patini*, *Cœlogyne Mas-sangeana*, *Cymbidium giganteum*, *Pleione Wallichiana*, *P. lagenaria*, *Oncidium Papilio Eckhardtii*, *Epidendrum Cooperianum*, &c.

Bronze Banksian Medal.

To Philip Crowley, Esq., Waddon House, Croydon (gardener, Mr. King), for a group of Orchids, in which the chief features were some fine specimens of *Odontoglossum grande* and four plants of *Vanda Kimballiana*, *V. tricolor*, and a fine variety of the handsome old *Cymbidium giganteum*.

Other Exhibits.

Geo. Hardy, Esq., Pickering Lodge, Timperley (gardener, Mr. W. Holmes), sent a cut spike of the true *Cattleya Massaiana*, one of *C. aurea*, and a spike of a hybrid *Cypripedium* (*C. caudatum* ♀ × *C. Ainsworthii* ♂) under the name *C. Hardy-anum* ×; but the Committee considered it to be identical with *C. macrochilum* ×, and wished to see it again for comparison with that variety.

Messrs. F. Sander & Co., St. Albans, sent some rare Orchids, among which were *Cattleya Brymeriana*, *C. aurea chrysotoxa*, *Platyclinis Cobbiana*, several *Masdevallias*, and *Cœlogyne fuscescens*.

Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels, sent the yellow *Odontoglossum Insleayi Lindeni*, which, however, had suffered so much on the journey that it was impossible to accurately judge of its merits.

Thos. Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr. R. Johnson), showed a fine spike of a good form of *Cattleya aurea*.

ORCHID COMMITTEE, NOVEMBER 1, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and ten members present.

Awards Recommended :—*Silver Flora Medal.*

To Messrs. B. S. Williams & Son, Upper Holloway, N., for a group of Orchids, in which were many species and varieties of Cypripediums, the rare *Lælia Perrinii nivea*, *Dendrobium album*, *Pleiones*, *Odontoglossums*, &c.

Silver Banksian Medal.

To Messrs. F. Sander & Co., St. Albans, for a group of rare Orchids, comprising *Cymbidium Winnianum* × *Cattleya labiata* Sanderæ and other forms of the autumn-flowering *C. labiata*, *Oncidium Saintlegerianum*, yellow with a large purple crest, *Brassia Lanceana*, *Angræcum caudatum*, &c.

First Class Certificate.

To *Cymbidium Winnianum* × (*C. giganteum* ♀ × *C. eburneum* ♂) (votes, unanimous), from Messrs. F. Sander & Co. This fine hybrid was raised by Chas. Winn, Esq., Selly Hill, Birmingham. In size and shape the flowers are equal to those of *C. giganteum*, but they are of an ivory white, with purple spots and lines on the labellum. The plant had five spikes of flowers, ranging from five to ten on a spike.

To *Spathoglottis Vieillardii rubra* (votes, unanimous), from Sir Trevor Lawrence, Bart., Dorking (grower, Mr. W. H. White). A very rich rose and crimson form of a rare species.

To *Cattleya leucoglossa* × (*C. Loddigesii* ♀ × *C. fausta* ♂) (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea. The flowers are as large as an ordinary *C. labiata*, wax-like, and of a clear rose-lilac, the broad front lobe of the labellum being white, the median portion yellow (fig. 32).

Award of Merit.

To *Lælia Perrinii nivea* (votes, unanimous), from Messrs. B. S. Williams & Son, Upper Holloway, N. A variety with white flowers, having a pale pink front lobe to the labellum.

To *Cattleya labiata* Sanderæ (votes, unanimous), from Messrs.

F. Sander & Co., St. Albans. This is a lovely form of the autumn-flowering *C. labiata*. Flowers blush-white with a purplish-crimson blotch on the labellum, which has a broad white margin.

To *Lælia elegans excellens* (votes, unanimous), from Thos. Statter, Esq., Stand Hall, Whitefield, near Manchester (gardener, Mr. R. Johnson). A richly coloured variety of the



FIG. 32.—*CATTLEYA LEUCOGLOSSA*. (From the *Journal of Horticulture*.)

“Turneri” section, but with a pure white base and tube to the labellum.

To *Cypripedium Arthurianum pulchellum* × (*C. Fairieanum* ♀ × *C. insigne Chantinii* ♂) votes, unanimous), from Messrs. Jas. Veitch & Sons, Chelsea. A good form of *C. Arthurianum* ×, with the addition of some crimson spots in the upper part of the dorsal sepal.

Other Exhibits.

Messrs. Hugh Low & Co., Clapton, N.E., staged a small group of Cattleyas, Vandas, Cypripediums, &c., and the new hybrid *Lælia claptonensis* × (*C. elegans* ♀ × *C. Dormani* ♂), which the Committee desired to see again.

Messrs. Charlesworth, Shuttleworth & Co., of Heaton, Bradford, exhibited *Miltonia Bluntii* Lubbersiana, which had previously received a First-class Certificate (September 1891).

H. Shaw, Esq., Stamford House, Ashton-under-Lyne, near Manchester (gardener, Mr. J. Cliffe), showed a *Cypripedium* (called *C. Shawianum*) of the reputed parentage *C. Lawrenceanum* ♀ × *C. lævigatum* ♂. The flower was like that of *C. Lawrenceanum*, and the Committee doubted the correctness of the record.

Messrs. Jas. Veitch & Sons also exhibited the curious hybrid *Dendrobium Stratius* (*D. japonicum* ♀ × *D. Dalhousieanum* ♂), with flowers coloured like *D. Dominianum*, and with a curious shield-shaped lip.

ORCHID COMMITTEE, NOVEMBER 15, 1892.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and five members present.

Awards Recommended:—

First Class Certificate.

To *Cypripedium Morganæ burfordiense* × (votes, unanimous), from Sir Trevor Lawrence, Bart., Dorking (grower, Mr. W. H. White). This selected variety of the Burford-raised *C. Morganæ* × is the best which has yet appeared.

To *Cypripedium Tityus* × (*C. Spicerianum* ♀ × *C. cœnanthum superbum* ♂) (votes, unanimous), from Messrs. James Veitch & Sons. A fine hybrid with flowers somewhat resembling *C. Leeanum*, but with all the parts broader and rounder.

Award of Merit.

To *Cattleya labiata albanensis* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. A very richly coloured form of *C. labiata vera*.

To *Catasetum* sp. (near *C. tabulare*) (votes, unanimous), from

Welbore T. Ellis, Esq., Hazlebourne, Dorking (gardener, Mr. Masterton). This singular flower had a labellum with a thickened raised table up the middle, as in *C. tabulare*; but its edges were rugose, and the surface spotted with brown.

To *Lælio-Cattleya Aurora* \times (*L. pumila* Dayana φ \times *C. Loddigesii* σ) (votes, unanimous), from Messrs. James Veitch & Sons, Chelsea. The plant bore a resemblance to *Cattleya Aclandiae*, having two leaves to most of the pseudo-bulbs. The flowers were much like those of *L. p. Dayana*, but had a larger and broader lip.

To *Cypripedium Perseus* \times (*C. Sedeni porphyreum* φ \times *C. Lindleyanum* σ) (votes, unanimous), from Messrs. James Veitch & Sons. This is one of the first crosses with *C. Lindleyanum*, and an acceptable hybrid. Flowers rosy crimson and cream colour.

Other Exhibits.

William Houghton, Esq., Hoe Street, Walthamstow, sent a fine spike of *Cattleya labiata vera* with six flowers.

Messrs. F. Sander & Co. exhibited a group of rare Orchids, containing several imported forms of *Cattleya labiata vera*; *Cypripedium Leeaenum giganteum* \times and *C. L. excellens* \times , each with six flowers; also *C. "E. Ashworth"* \times (*C. plunierum* φ \times *C. Spicerianum* σ), *C. "G. S. Ball"* \times (*C. Spicerianum* φ \times *C. Lawrenceanum* σ), *Aërides Balfouri*, *Odontoglossum Rossii albens*, &c.

Messrs. B. S. Williams & Son, Upper Holloway, N., contributed a group of Orchids, in which *Cypripedium Pitcherianum* \times , Williams' var., was very fine.

Messrs. Hugh Low & Co., Clapton, sent a group, among which were several fine plants of *Cypripedium bellatulum*, *C. Arthurianum* \times , *C. insigne Mooreanum*, *Saccolabium bigibbum*, *Vanda Amesiana*, *V. Kimballiana*, &c.

Sir Trevor Lawrence, Bart., sent a plant of *Cypripedium pavoninum* \times (*C. Boxalli* φ \times *C. venustum* σ) and a spike of the rich crimson *Calanthe sanguinaria* \times .

Thos. Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr. R. Johnson), exhibited a fine spike of *Cattleya Harrisii* \times (*C. guttata Leopoldi* φ \times *C. Mendelii* σ).

Earl Cowper, Panshanger, Hertford (gardener, Mr. Fitt),

sent four plants of the old form of *Cypripedium insigne*, the flowers of which had some of the lower sepals divided and others with white-tipped petals.

Messrs. James Veitch & Sons showed a flower of their *Cypripedium Crethus* \times (*C. Spicerianum* φ \times *C. Argus* σ). The Committee requested to see it again.

C. J. Lucas, Esq., Warnham Court, Horsham (gardener, Mr. Duncan), sent two plants of *Angræcum bilobum*, the one with a lax and the other with a dense raceme; also a flower of *Cattleya aurea*, with rose-tinted petals.

Messrs. John Laing & Son, Forest Hill, staged a plant of a spotted form of *Odontoglossum crispum*; and Reginald Young, Esq., Fringilla, Linnet Lane, Sefton Park, Liverpool (gardener, Mr. Poyntz), sent a three-flowered spike of *Cattleya labiata*, Young's var., in which the upper sepal and upper halves of the lower sepals were petaloid, and consequently much broader than usual; the petals and upper sepal were blotched with crimson at the tips. It being an abnormal form, although very beautiful, the Committee desired to see its next flowers, with a view of testing their constancy.

ORCHID COMMITTEE, DECEMBER 13, 1892.

HARRY J. VEITCH, Esq., in the Chair, and fifteen members present.

Awards Recommended:—

Silver Banksian Medal.

To Sir Trevor Lawrence, Bart. (grower, Mr. W. H. White), for a fine specimen of *Sophronitis grandiflora*, with over forty dark scarlet flowers.

To C. E. Smith, Esq., Silvermere, Cobham (gardener, Mr. J. Quarterman), for a specimen of *Cypripedium insigne* over four feet across, and well flowered.

Bronze Banksian Medal.

To S. G. Lutwyche, Esq., Beckenham, for two fine specimens of *Cypripedium insigne* and two of *Zygopetalum Mackaii*.

First Class Certificate.

To *Cattleya labiata alba* (votes, unanimous), from W. Wells,

Esq., Broomfield, Sale, near Manchester (gardener, Mr. R. Hinde). A fine white form of the autumn-flowering *C. labiata*.

To *Sophro-Cattleya Calypso* × (*Sophronitis grandiflora* ♀ × *Cattleya Loddigesii* ♂) (votes, unanimous), from Messrs. Jas. Veitch & Sons, King's Road, Chelsea. A beautiful hybrid, with warm rose-pink flowers and orange blotch in the labellum.

Award of Merit.

To *Cypripedium Johnsonianum* × (*C. nitens magnificum* ♀ × *C. Lawrenceanum* ♂) (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. A fine bold flower, with much the form of *C. Lawrenceanum*.

To *Masdevallia McVittiae* × (*M. towarensis* ♀ × *M. Veitchii* ♂) votes, 6 for, 5 against), from W. Thompson, Esq., Walton Grange, Stone (gardener, Mr. Stevens). Flowers borne like those of *M. Hincksiana* ×, but white tinged with lilac.

To *Lælia anceps Oweniana* (votes, unanimous), from G. D. Owen, Esq., Selwood, Rotherham (gardener, Mr. B. Watts). A large and highly coloured form, with white flaking on the segments.

To *Cattleya amethystoglossa*, Selwood var. (votes, unanimous), from G. D. Owen, Esq. This has a larger flower, with broader segments, than the type.

To *Lælia Finckeniana* × (votes, unanimous), from C. W. Fincken, Esq., Hoyland Hall, Barnsley (gardener, Mr. Milburn). This appears to be a natural hybrid between *L. albida* and *L. anceps Sanderiana*, the plant having the growth which might result from such origin, and the flowers being intermediate.

To *Cypripedium Arete* × (*C. concolor* ♀ × *C. Spicerianum* ♂) (votes, 7 for, 1 against), from Messrs. Jas. Veitch & Sons. This pretty hybrid is of the section of *C. microchilum*; flowers white tinged with rose.

Botanical Certificate.

To *Pleurothallis punctulata* (votes, unanimous), from R. I. Measures, Esq., Cambridge Lodge, Camberwell (gardener, Mr. Simpkins). A pretty species, with glaucous leaves and flowers, resembling *Restrepia guttata*.

To *Dendrobium Treacherianum* (votes, unanimous), from W. E. Brymer, Esq., Ilsington House, Dorchester (gardener, Mr. John Powell).

Other Exhibits.

Sir Trevor Lawrence, Bart. (grower, Mr. W. H. White), staged a fine group of hybrid *Calanthes* and the new *Dendrobium burfordiense* \times (*D. Linawianum* φ \times *D. heterocarpum* σ).

His Grace the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), staged a fine bank of *Cypripedium insigne* and *Calanthe Veitchii*.

Messrs. B. S. Williams & Son, Upper Holloway, sent a small group of Orchids.

Messrs. Hugh Low & Co., Clapton, E., staged a group of showy Orchids.

C. W. Lea, Esq., Parkfield, Hallow, Worcester (gardener, Mr. A. G. Cutt), sent a fine spike of *Vanda teres alba*.

Messrs. Jas. Veitch & Sons exhibited *Epiphronitis Veitchii* \times , *Cypripedium Aeson* \times (*C. insigne* φ \times *C. Druryi* σ), *C. Pheres* \times , (*C. insigne* φ \times *C. hirsutissimum* σ), *C. Aenone* \times (*C. Hookeræ* φ \times *C. superbiens* σ), and *C. Cleola* \times (*C. Schlimii album* φ \times *C. reticulatum* σ).

Messrs. F. Sander & Co. staged a select group of Orchids, in which were many rare *Cypripediums*, *Cattleya O'Brieniana*, *Oncidium Phalænopsis*, *Dendrobium Cassiope*, &c.

Alex. Fraser, Esq., Westerfield House, Ipswich (gardener, Mr. Geo. James), showed *Cattleya Leopoldii* *Pernambuco* var.

Messrs. Pitcher & Manda, Hextable, Swanley, staged a dozen forms of *Cypripedium insigne*, *C. Niobe* \times , and *C. N.* \times *Short-hills* var.

Philip Crowley, Esq., Waddon House, Croydon (gardener, Mr. King), showed *Angræcum pellucidum*.

Messrs. Linden (l'Horticulture Internationale), Parc Leopold, Brussels, and B. D. Knox, Esq., Ardmillan, Caversham, showed plants of *Cattleya Alexandræ*. The Committee desired to see them again.

Chas. Ingram, Esq., Elstead House, Godalming (gardener, Mr. T. W. Bond), exhibited *Cypripedium marmorophyllum* \times *C. Spicerianum* σ ; *C. Charles Reffold* \times (*C. ænanthum superbum* φ \times *C. Spicerianum* σ), and *C. Lathamianum inversum* \times .

Mr. Bolton, Wilderspool, Warrington, sent flowers of *Cypripedium insigne*, *C. Chamberlainianum*, and *Cattleya labiata*.

Thos. Statter, Esq., Stand Hall, Whitefield, Manchester,

showed a distinct form of *Cypripedium insigne* of the *Chantinii* type.

Norman C. Cookson, Esq., Oakwood, Wylam-on-Tyne, sent a flower of the fine clear yellow and white *Cypripedium insigne* *Sanderæ*.

NARCISSUS COMMITTEE.

MARCH 22, 1892.

Rev. G. H. ENGLEHEART in the Chair, and nine members present.

Mr. E. H. Jenkins showed bulbs attacked with what he considered to be a new fungoid disease. They were referred to the Scientific Committee.

He also drew attention to the ravages of bulb mites, and suggested that they were the cause of the well-known "basal rot" so fatal to *Narcissi*; and a discussion took place as to whether the mites caused the basal rot or whether the bulb smitten from some other cause with the rot attracted the mites. Mr. Engleheart suggested that basal rot was only the regular method in which a bulb died, its diffusion in a state of nature being chiefly due to seed-propagation, whereas in a state of cultivation we rely almost entirely on reduplication of the bulb, which, in his opinion, must in time come to an end in each individual instance by the ordinary method of death. This question was also referred to the Scientific Committee.

Miss Doyne sent blooms of a variety found in a cottage garden in county Carlow, and called by her *St. Austin*. The colour of the flowers, which were pure selfs, was a very pale sulphur. It was named some years ago *N. minor citrinus*, but the Committee decided unanimously that it was no near relation of *N. minor*, approaching rather to the variety called *N. asturicus*. They did not consider it of any great floral merit.

The Rev. E. Gabbett, Croom Rectory, Limerick, sent flowers of a variety found in his garden in 1884, and now called *Croom-a-boo*. Its peculiarity consists in a sort of frilling which runs over the outside of the trumpet. The Committee considered it to be an abnormal form of *Ard Righ*, and, if constant, very desirable as a variety; but as certain members of the Committee reported

having tried the plant with the result that the frilling gradually disappeared under cultivation, and it passed into a normal Ard Righ, the Committee decided to withhold their recognition of it until this question of constancy had been more widely experimented on.

Mr. Hartland sent a seedling from *N. obvallaris*. It was considered inferior to its parent, and was also reported as a form often met with amongst wild *obvallaris*.

Mr. Engleheart showed some very interesting blossoms and plants in pots, illustrating the results of reciprocal hybridisation, viz. :—

N. triandrus ♀ × *N. (Corbularia) monophylla* ♂, and
N. (C.) monophylla ♂ × *N. triandrus* ♂.

In this case of reciprocal hybrids the resultant flowers were almost identical. He also exhibited

N. (C.) citrina ♀ × *N. (C.) monophylla* ♂.
N. (C.) citrina ♀ × *N. triandrus* ♂.

In these two crosses it was noticeable that in both the mother (*citrina*) had given the colour.

Prizes.

Class 5.—Collection of Daffodils. Polyanthus excluded. Open. *First Prize*, Barr Silver Medal, to H. J. Adams, Esq., Roseneath, Enfield (gardener, Mr. C. May). *Second Prize*, Barr Small Silver Medal, to Rev. G. P. Haydon, Doncaster. *Third Prize*, Barr Bronze Medal, to H. Berkeley James, Esq., Carshalton (gardener, Mr. J. Gibson).

NARCISSUS COMMITTEE, APRIL 12, 1892.

Rev. G. H. ENGLEHEART in the Chair, and eight members present.

Award Recommended :—

First Class Certificate.

To Golden Bell (votes unanimous), from the Rev. G. H. Engleheart, Appleshaw. The character of the flower is dis-

tinctly drooping; the trumpet very large, deep yellow in colour, and much frilled at the edge; perianth of a pale clear yellow.

Notice was drawn by several members to the way in which the orange colour was absent, or partially absent, from the varieties generally possessing it, *e.g.* *Nelsoni aurantius*, C. J. Backhouse, *incomp.* *Leedsii*, &c. This was attributed to the very backward condition of the plants owing to cold weather till the end of March, and the sudden forcing of them into bloom by the very hot suns at the beginning of April.

Dr. Hogg sent some malformed flowers of common *Pseudo*, in which the mouth of the trumpet was drawn together and almost closed. It is a well-known malformation, probably due to frost or mechanical injury just as the flower is opening.

The Rev. W. Wilks showed a double seedling raised from double *Telamonius*, which was precisely similar to the form known as the Silver-and-Gold of Dutch growers.

The Rev. G. H. Engleheart sent a most beautiful and interesting display of seedlings.

The varieties *Countess of Annesley* and *Golden Bell* were duly "registered" by the Committee as distinct and useful varieties.

NARCISSUS COMMITTEE, APRIL 19, 1892.

Rev. W. WILKS in the Chair, and seven members present.

Award Recommended :—

Botanical Certificate.

To Dr. Laumonier, Vernail, France, for hybrids between *N. poeticus* × *N. biflorus* (votes, unanimous). The flowers were similar to *biflorus* except that the perianth was slightly larger and whiter, and the cup distinctly margined with orange. Great interest attached to this hybrid, as *biflorus* had hitherto been considered to be absolutely sterile.

Miss Reeves sent specimens of double *incomparabilis* (*Phoenix*) and of *Orange Phoenix*, which she considered distinct from the usual forms. The Committee considered them to be only very strong and well-grown specimens of the ordinary type.

The Rev. G. H. Engleheart exhibited a most beautiful flower

of the Johnstoni type which he had raised from *N. Horsfieldi* × *N. triandrus*; and, in order to exemplify the probable parentage of the now well-known Sir Watkin, he showed a very similar flower he had produced from a yellow *N. Ajax* × *N. poeticus*.

NARCISSUS COMMITTEE, MAY 3, 1892.

C. R. SCRASE DICKINS, Esq., in the Chair, and four members present.

The Rev. G. Engleheart, Appleshaw, Andover, exhibited several seedling Narcissi. An instance of high colouring in the corona was *N. poeticus* ♀ × *N. Ajax* ♂.

N. poeticus recurvus ♀ × *N. Ajax* ♂ showed the white reflexed petal of the seed parent, while the corona of one flower was large and lemon-yellow, and that of another was small with a dark orange band. In *N. Horsfieldi* × *N. poeticus* ♂, the pollen parent gave no colour, but had the effect of shortening the corona.

The effect of fertilising *N. poeticus ornatus* with the pollen of *N. p. poetarum* was to deepen the colour of the corona in the seed parent, and to retain the better petals and constitution of the pollen parent.

Mr. T. S. Ware, Tottenham, sent flowers of *N. Telamonius minor plenus*, which the Committee considered to be identical with the ordinary *N. Telamonius*.

Messrs. Barr & Son, Covent Garden, exhibited among a large collection, *N. incomparabilis* "Mabel Cowan" and *N. i.* "George Nicholson," the latter having creamy petals and a yellow corona.

The Rev. S. E. Bourne, Dunstan Vicarage, Lincoln, exhibited flowers of *Daffodil Ellen Barr*. The Rev. G. P. Haydon explained that he found it years ago mixed with the variety *Falstaff*, and, being distinct, he gave it the above name.

The Rev. C. Wolley Dod, Edge Hall, Malpas, sent flowers of a hybrid which he had collected in the Pyrenees in 1886. The sepals were creamy white and the corona deep orange-yellow. It was provisionally named *Philip Hert*.

NARCISSUS COMMITTEE, MAY 17, 1892.

Rev. W. WILKS in the Chair, and six members present.

Herr Krelage, of Haarlem, sent a very distinct flower which he called *Semipartitus plenus*. It was almost exactly like the well-known double *poeticus*, but of a pale yellow colour. It was not, however, quite so double as the *poeticus* usually is, but if cultivation will produce greater doubleness in it, it will prove a great acquisition to late flowers.

Mr. Walter Ware brought some very lovely flowers of *Bernardi* from collected bulbs, some of them having bright orange trumpets or cups.

Prize.

Barr's Silver Gilt Flora Medal.

To the Rev. G. H. Engleheart, M.A., Appleshaw, Andover, for *Narcissus Golden Bell*, which received a First-class Certificate on April 12, and was considered to be the best English-raised seedling *Daffodil* shown during the season of 1892.

Books, &c., presented or purchased for the Lindley and Royal Horticultural Society's Library from Jan. 1 to Dec. 31, 1892.

"Agricultural Gazette of New South Wales." "American Philosophical Society, Transactions and Proceedings." "Annales des Sciences Naturelles." "Atti della R. Università di Genova"—F. Delpino. "Beihefte zum Botanischen Centralblatt." "Zeitschrift für Forst- und Jagdwesen"—Dr. B. Danckelmann. "Boletim da Sociedade Broteriana." "Botanical Magazine." "Botanische Zeitung." "Botanische Jahrbücher für systematik Pflanzengeschichte." "British Ferns"—Moore. "British Moss Flora"—Braithwaite. "Communicability of Peach Yellows"—Smith. "Contributions from U.S. National Herbarium"—Vasey. "Culture of Vegetables and Flowers"—Sutton. "Die natürlichen Pflanzenfamilien." "Essay on the Pelargonium"—Pearson. "Flora Italiana." "Flora of British India"—Hooker. "Flora Batava." "Flora oder allgemeine botanische Zeitung." "Flore Forestière de la Cochinchine." "Forage Plants of Australia"—Turner. "Forstlich-naturwissenschaftliche Zeitschrift." "Fruit Culture"—Cheal. "Gardeners' Chronicle." "Gardeners' Magazine." "Gardening World." "Garden Work." "Garden." "Garden and Forest." "Gartenflora." "Grasses of the South West"—Vasey. "Handbuch der Nadelholzkunde"—Beissner. "History of Ferns"—Smith. "Illustrierte Garten-Zeitung." "Illustrationes Floræ Atlanticæ." "Illustrationes Floræ Insularum Maris Pacifici"—Drake del Castillo. "Icones Plantarum"—Hooker. "Journal of Botany." "Journal de la Société Nantaise d'Horticulture." "Journal of Horticulture." "Journal of the Linnean Society." "Journal of the

Geological Society." "Journal of the Royal Agricultural Society." "Indische Heil- und Nutzpflanzen"—Tschirch. "Kew Bulletin." "Kryptogamen-Flora"—Rabenhorst. "La Taille des Arbres Fruitiers"—Forney. "La Truffe"—Chatin. "My Gardener"—Ward. "Missouri Botanical Garden Report." "Nouvelles Arch. du Muséum d'Histoire Naturelle." "Orchidienbuch"—Stein. "On the Modification of Organisms"—Syme. "Plantæ Europææ"—Richter. "Philosophical Notes on Botanical Subjects"—Bonavia. "Proceedings of the Royal Society." "Potato Culture for the Million"—Ward. "Revue Horticole." "Samos"—Barbey. "Schweizerisches Pflanzen-Idiotikon"—Durkeim. "Synopsis Muscorum europæorum"—Schimper. "Synopsis Filicum"—Hooker and Baker. "The Uses of Plants"—Boulger. "The Narcissus: its History and Culture"—Burbidge and Baker. "The Silva of North America"—Sargent. "Transactions of the Massachusetts Horticultural Society." "Transactions of the Wisconsin Academy of Sciences, Arts, and Letters." "Vines and Vine Culture"—Barron.

The Council of the Royal Horticultural Society and the Trustees of the Lindley Library will be grateful for presents of works on Horticulture and Botany, receipt of which will be duly acknowledged.

Donors of Plants, Seeds, &c., to the Society's Gardens at Chiswick during the year 1892.

- APPLEBY, H., Dorking. Potatos.
 BABB & SON, Messrs. Perennial Asters, vegetable seeds, bulbs, &c.
 BENARY, E., Erfurt. Collection of vegetable seeds.
 BENNETT POË, J., Hounslow. Fruit of *Tacsonia ignea*.
 BROWN, G., Walsall. Seedling Potatos.
 BROWN, —, Guildford. Apple grafts.
 BUNYARD, G., Maidstone. Strawberry plants.
 CANNELL & SONS, Swanley. Begonias.
 CARTER & CO., Holborn. Vegetable seeds.
 CARTER, J., Keighley. Raspberry plants.
 CLARKE, Col., Daventry. Seeds of *Chrysanthemum*.
 COOPER, TABER & CO., Rivenhall. Vegetable seeds.
 DAWNAY, L. P., M.P. Apple grafts.
 DEAN, A. Hybrid Cabbage seed.
 DICKSON & CO., Edinburgh. Apple trees.
 DICKSONS, Chester. Herbaceous Phloxes.
 DOBBIE & CO., Rothsay. Collection of vegetable and flower seeds, herbaceous plants, Violas, &c.
 DUNN, M., Dalkeith. New Zealand Veronicas.
 ECKFORD, H., Wem, Salop. Seeds of Sweet and Culinary Peas.
 FRASER, J., Lea Bridge. Peaches, Pears, and Plum trees.
 FORBES, J., Hawick. Herbaceous Phloxes, seeds of Stocks.
 FLETCHER, H., Annesley. Potatos.
 FREDERICK, Sir CHARLES, Bart. Apple grafts.
 GODFREY, W. J., Exmouth. Apple grafts.
 GEORGE, G., Putney. Patent Tobacco for fumigating.
 GILBERT, R., Burghley. Tomato plants.
 HARRIS, A., Wavendon. Potatos.
 HARRIS, G., Clifton. Polyanthus seed, cuttings of *Pelargoniums*, Sweet Williams.
 HARTLAND, W. B., Cork. Potatos.

- HANAN, HUGH, Edinburgh. Cabbage seed.
 HAYDON, G. P., Doncaster. Pæony sp.
 HICKS, J., Bolton. Tomato seed.
 HOLMES, W. G., Tain, N.B. Seed of Peas, Cabbage, &c.
 HUMPHREY, J., Aston. Damson grafts.
 HURST & SON, Houndsditch. Solanum seed.
 JOHNSTONE, W. W., Boston. Potatos.
 KELWAY & SON, Langport. Herbaceous plants, vars.
 KINGSMILL, A., Stanmore. Crocus bulbs.
 LEMOINE, V., Nancy, France. Begonias, Phloxes.
 LAXTON, T., Bedford. Peas.
 LEONARD, H. L., Guildford. Rock plants.
 LETTS, E., Northampton. Two varieties of Potatos.
 LONDONDERRY, Marquis of, Sunderland. Apple grafts.
 LYNCH, IRWIN, Cambridge. Melon seed.
 MACOWAN, Prof. P. Seeds of Homoglossum Merianella.
 MCCORMICK, G., Coombe Ridge. Potatos.
 MCDUGALL, G. Strawberry plants.
 MELVILLE, F. A., Lincoln. Rhubarb.
 MILES, C. L., Hampton Wick. Apple grafts.
 MILES, E., Lincoln. Seed Potatos—16 vars.
 MAHER, R., Newbury. Potatos.
 NICHOLLS, W., Hounslow. Loquat seed.
 ORR, W., Stow Hall, Norfolk. Apple grafts.
 PAUL & SON, Cheshunt. Dahlias, Phloxes.
 PETTIGREW, A., Cardiff. Grape vines.
 PITCHER & MANDA, Swanley. Chrysanthemums, herbaceous plants.
 RIDGEWELL, H., Cambridge. Potatos.
 ROBINSON, W., Lincoln's Inn Fields. Clematis seed.
 ROSS, F., Merstham. Crinum bulbs.
 ROYAL GARDENS, Kew. 200 hardy herbaceous and rock plants.
 SHARPE & Co., Sleaford. Peas.
 STOTT & SON, Alnwick. Raspberry plants.
 SMITH, E. D., Sheffield. Tomato seed.
 SUTTON & SONS, Reading. Bedding Begonias.
 SHERBORNE, F. ST. JOHN. Flower seeds.
 TROUGHTON, W., Preston. Apple and Pear grafts.
 TURNER, C., Slough. Dahlias, &c.
 VEITCH, R., Exeter. Emmenanthe penduliflora.
 VEITCH, J., & SONS, Chelsea. Vegetable seeds, Begonias.
 VILMORIN, ANDRIEUX & Co. Vegetable seeds, Begonias, Cannas, &c.
 WEEDON, F., Hillingdon. Apple grafts.
 WILKS, Rev. W., Shirley. Crinum bulbs, Perennial Asters, Apple grafts.
 DEPARTMENT OF AGRICULTURE, Melbourne. Apple grafts.
 BOTANICAL DEPARTMENT, Jamaica. Seeds of Gouania domingensis.

N.B.—The Awards made on the recommendation of the Fruit, Floral, and Orchid Committees during the year 1892 will be found in the "List of Plants, &c., certificated by the Society from 1859 to 1893," which has now been published, price 2s. 6d.

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